

AMERICAN BEE JOURNAL

MAY, 1920



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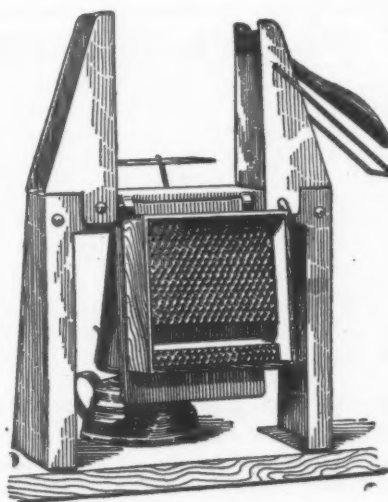
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Smoke Engine or Doctor in copper, \$1 extra.



The Big Smoke has just been produced in response to a demand for a larger size smoker, one that will hold more fuel, require filling less often, from extensive bee handlers. The shield designated by the letter "B" in the cut above, is designed as a matter of protection from the hot fire pot. Many hold the smoker by the bellows, between the knees, when at work, and the shield will prevent burning of the trousers or one's legs.

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2½ lb., Friction Top cans, cases of 24
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5 lb., Friction Top pails, crates of 12
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We save you money on cans. Ask for special quotations. Shipments from Michigan, Ohio, Illinois and Maryland factories.

A. G. WOODMAN CO.

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"GRIGGS SAVES YOU FREIGHT"

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If you have lost your bees the past winter, let us send you some 3-lb. packages next month to replace them and save those good combs from the moth worm. Bear in mind one package will pay for 3 and the 3-lb. package is the most profitable to buy. Only a limited number contracted for, so order today.

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for the asking. Don't delay, but order today.

GRIGGS BROS. CO., TOLEDO, OHIO DEPT. 24

"GRIGGS SAVES YOU FREIGHT"

QUEENS

PACKAGE BEES

QUEENS

Did you read Prof. H. F. Wilson's write-up in Gleanings, March issue, in regard to the packages of bees and queens he received from me last year? Notice he said some of those packages of bees and queens received in May gathered 150 pounds of honey. That speaks for itself in regard to the quality of my **Queens**. The 2-pound packages of bees and queens I shipped Mr. David Running in 1917 gathered 140 pounds of honey (He was then President of the National Beekeepers' Association). Have booked all the orders I can guarantee shipping on time for April, but send for **Free Circular** for later shipping, which states our guarantee; also gives prices on bees by parcel post, nuclei, etc., 3-banded and Golden queens. Have secured the best queen men obtainable, and we are prepared to turn out 6,000 **Queens** per month. They do nothing but take pains in rearing the best of queens. Careful inspection before shipping. Have an entirely separate crew for shipping bees, etc.; 20 years a beekeeper.

Prices F. O. B. Here by Express

1-lb. pkg. bees \$2.40, 25 or more \$2.16

2-lb. pkg. bees \$4.25, 25 or more \$3.83

3-lb. pkg. bees \$6.25, 25 or more \$5.62

Add price of queen when ordering bees.

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Select untested, \$1.65 each; 25 or more, \$1.50.

Tested \$2.50 each, 25 or more \$2.25

Select tested \$3.00 each

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Superior Foundation assures Superior Quality

HUNDREDS PRONOUNCE IT "BEST BY TEST"

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The enormous demand for SUPERIOR FOUNDATION has required the doubling of our manufacturing facilities. We have doubled our Ogden factory in size for 1920, and have also added sufficient new machinery to double our output of foundation. We now occupy over 20,000 square feet of floor space with our enlarged factory of three floors, and invite you to visit us whenever in Ogden.

THERE'S A REASON for this rapid growth. Acquaint yourself with the superiority of our produce. Every pound we manufacture is backed by our reputation for highest quality and square dealing.

BEESWAX ARRIVALS during the past thirty days have been very liberal, but we still require additional quantities at highest market price.

OUR BEE SUPPLY DEPARTMENT is humming. We can fill your order for "Everything in Bee Supplies." Prices on request.

SUPERIOR HONEY CO., Ogden, Utah
(Manufacturers of Weed Process Foundation)

THE FIRST COMB FOUNDATION

Bee Comb Foundation is a comparatively recent product. Previous to 1850 very few beekeepers realized the value of elimination of drone-comb. Some few did. These got straight worker combs by cutting up the crooked combs and including only worker comb in the frames. The elder member of the present Dadant firm well remembers this procedure practiced together with his father, Charles Dadant.

Not only did they remodel the combs of their own colonies, but bought dead colonies everywhere possible to increase the amount of worker comb available. And yet they were always short of worker comb.



JOHANNES MEHRING

It was in Europe that the first attempt at foundation was made. Johannes Mehring in 1857 produced crude plates of wax with the hexagonal impression. But these were far from perfect. In fact, much drone-comb was built from them. But it was a beginning.

The waffle iron presses of Rietsche & Given followed. The sheets became of better impression, but were still hard to ship owing to their brittleness.

The roller mills of American make were later to remedy this defect, gradually improving with continued experiment.

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**CATALOG AND PRICES ON BEE SUPPLIES, BEESWAX, WAX WORKING INTO COMB
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"SAG-PROOF" FRAMES

**Stop losing dollars from sagged brood combs!
Use frames wired to support combs properly!
Follow the lead of America's best beekeepers!
Use Lewis "Sag-Proof" frames in your hives!**

HOW THEY ARE MADE

Expensive machinery installed in the Lewis "Beeware" factory pierces Hoffman end bars so the wiring holes come nearer the topbar and give support where it is most needed—at the top.

Principles involved in this improvement have been approved from actual samples sent to and used by such leaders as Frank Rauchfuss, G. S. Demuth, J. E. Crane, A. G. Woodman, E. G. LeStourgeon, N. E. France, Ben Davis, H. D. Murry, E. S. Miller, F. B. Paddock, H. F. Wilson, G. H. Rea, E. G. Baldwin and Dadants.

Dr. C. C. Miller, after examining samples sent to him, wrote: "The new wiring, as compared with the old wiring with the upper wires farther apart, ought to be worth many dollars to the business of honey production."

Get in line and use Lewis "Beeware" now. "Sag-Proof" frames are just one instance of our interest in your beekeeping success. Your catalog gives your distributor's name.



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VOL. LX—NO. 5

HAMILTON, ILL., MAY, 1920

MONTHLY, \$1.00 A YEAR

THE EVOLUTION OF BEEKEEPING PRACTICE

BY G. S. DEMUTH

THERE are certain well-defined eras through which beekeeping has passed in its development. The changes in beekeeping practice are reflected in the development of the beehive. In order to understand fully the reason for the present-day construction of the standard hive and its adaptation to modern beekeeping practice, it is necessary to trace the changes that have been made in hive construction and search for the reasons for each of them. It is my purpose in this discussion to point out briefly the different eras in the development of beekeeping in this country, and at the same time trace the more important changes in the development of the beehive.

The Box Hive Era Previous to 1853

Previous to the Langstroth invention was the box-hive era, or the ancient history in beekeeping practice. During this era, honey for human use was secured by "taking up" or brimstoning in the fall the heaviest colonies, and during the latter part of the era by using a small box or "cap" placed on top of the hive over an auger hole through which the bees could pass into the box. Beekeeping was quite general, but the number of colonies for each beekeeper was relatively small. The honey produced was largely for home use, though during the latter part of the era considerable quantities of honey began to find its way into the markets.

The most remarkable feature of the box-hive era is the fact that it produced the great leader and teacher, Moses Quinby, whose book, "Mysteries of Beekeeping Explained," is a classic in American beekeeping literature. In the first edition of this book Quinby described in detail the construction of the Quinby box hive and the system of management which he had evolved for its use.

The size of this box-hive had been carefully worked out and it is interesting to note the reasons given by Quinby for a brood-chamber of 2,000 cubic inches, which he used and recommended. In this connection he wrote: "We must remember that the queen needs room for all her eggs, and the bees need space to store their winter provisions; for reasons before given, this should be in one apartment. When this is too small, the consequence will be their winter supply of food is liable to run out. The swarms from such will be smaller and the stock much more liable to accidents which soon finish them off. * * Suppose you locate a swarm in a hive the size of Dr. Bevan's (1,200

cubic inches), the bees would occupy nearly all of this room with brood-combs; now, if you put on boxes and as soon as filled put on empty ones, the amount of surplus honey would be great; very satisfactory for the first summer, but in a year or two your little hive is gone. * * * If too large * * * they last a long time and are but little profit in surplus honey and swarms."—(Moses Quinby, 1853, "Mysteries of Beekeeping Explained," pp. 42-43).

The Box-Honey Era, 1853-1867

The Langstroth frame and hive was patented under date October 5, 1852. "Langstroth on the Hive and Honey-bee" was published early in the summer of 1853, thus appearing simultaneously with Quinby's work, "Mysteries of Beekeeping Explained." Up to this time neither of these great leaders knew of the work done by the other. The invention of the movable frame by Langstroth marked the beginning of modern beekeeping and ushered in the box-honey era. During this period surplus honey was produced in boxes, each holding 5 to 10 pounds of honey, which was built in the boxes by the bees. These boxes were usually made with glass on one or more sides to show the honey advantageously when it was offered for sale in the markets. It was a development from the old cap of earlier days. There is evidence in the early literature indicating that Langstroth, after much careful experimenting, chose the particular depth of his hive because this depth of the brood-chamber caused the bees to enter these empty boxes and fill them with honey more readily than a deeper brood-chamber.

The extra shallowness of the Langstroth brood-chamber in comparison with the familiar tall box-hive or gum, brought a storm of protest from



Box hive with shallow cap, the first step in the development of our present system of taking surplus honey.

beekeepers, many of whom following the lead of Quinby, adopted the Langstroth principle of the movable combs, but used a deeper frame to conform more nearly to the then prevalent idea as to the proper shape for a beehive. Quinby's first modification of the Langstroth hive was 12 x 12½ x 19½ in., inside measure, and contained eight frames, each 18½ in. long and 11¼ in. deep. This gives a cubic capacity within the frames slightly greater than the Quinby box-hive. The American frame was originally 12½ in. wide and 16 in. or more deep, thus making a hive more nearly the shape of the conventional box-hives, but was afterwards changed to 12 x 12 in. The Gallup frame was 11¼ x 11¼ in., thus fitting the Quinby hive when the frames are placed crosswise in the brood-chamber. The Adair frame was 13¼ x 11¼ in., thus using the Quinby depth, the length being such that it would fit a Langstroth hive if placed crosswise in the brood-chamber.

These deeper frames were not well adapted to box-honey production when the Langstroth principle of top storing was used; therefore, some who favored the deep frames arranged their hives for side storing, placing the boxes within the same apartment with the brood-combs and arranged on each side of the brood. This, however, did not prove entirely satisfactory and the Langstroth frame and hive in connection with top storing was championed by many producers of box-honey.

The First Extracted Honey Era, 1867 to 1876

The honey extractor was invented in 1865, but was first heard of in this country in 1867. Many crude home-made machines were built by beekeepers at once, and the use of the honey extractor was taken up with great enthusiasm. In their zeal in the use of this new implement bee-

keepers extracted at frequent intervals during the honey flow, taking all the honey from the brood-chamber as well as from the combs in an upper story. The difficulty of removing the brood-combs for extracting, when a two-story hive was used, and when the extracting process was repeated every few days, suggested at once the advantage of having all the frames in a single hive-body, thus making all the combs readily accessible when the cover is removed. This gave the advocates of the deeper frame their opportunity, since in extracted honey production it was no longer necessary to use a shallow brood-chamber, as in box-honey production. Even Langstroth seriously considered changing his frame to a deeper one.

On this subject he wrote, in a letter to A. I. Root, on April 4, 1872, as follows: "Dear Friend: I hope you will try the 12x12 in., but I have many years ago tried such frames and do not like them—too much cost to make and handle, etc. I think the hive 14x14x13 in. deep much better and shall probably adopt that shape, as the honey emptier '(note honey Extractor)' and side boxes make it no longer so desirable to have a shallow hive." The next day, April 5, he wrote: "You will see from my last that I propose to change the dimensions of my frame. Perhaps there will not be much choice between the hive 14x14x13 in. and 12x12x12 in., but I prefer ten frames to twelve."—*Gleanings in Bee Culture*, Vol. 2, p. 58).

At this time Adair began strenuously to advocate a hive which he called the New Era Hive, and which later was known as the Long Idea Hive. This hive was arranged for the brood-combs and extracting-combs in the same apartment, and in some cases frames were added until the hive was 4 feet long. Two years later A. I. Root, who previous to this time had been a consistent advocate of the

Langstroth frame, proposed a standard hive built on the long idea principle to hold 20 Adair frames. This was known as the Standard. The long controversy on the hive question was now thought to have been finished and the question finally settled for all time. Furthermore, the use of such a hive in connection with frequent and close extracting practically solved the swarming problem. However, the standardization of the beehive and beekeeping practice was not to be accomplished so soon, for another great invention appeared on the beekeeping horizon, ushering in a new era in beekeeping, upsetting the established system of management and changing the destiny of hive construction. I refer to the invention of comb-foundation and the ushering in of the comb-honey era.

Comb-Honey Era, 1876 to 1906

Impressed sheets of beeswax, making a crude foundation without side walls had been used in Europe since 1857. In this country Samuel Wagner, founder of the American Bee Journal, experimented in making embossed sheets of beeswax and in 1861 secured a patent on such embossed sheets. After some delays incident to the Civil War and the reconstruction period, he entirely abandoned the project. Several attempts were made to build machines to stamp the wax sheets by various persons, and finally, in 1874 and 1875, samples of foundation which proved to be readily acceptable by the bees, were sent out to beekeepers by "John Long."

In 1875 A. I. Root, with characteristic enthusiasm and energy, began his experiments in making foundation. At first he built up plates to emboss the wax sheets, making the plates by assembling "type" which he moulded, each type having the upper face modeled after the base of the cell. These types were soldered together in such a manner that they formed a solid plate, two of which were used to impress the wax sheets. He also, during the same winter, worked on a roll machine, the first of which was finished at Medina, Ohio, on February 26, 1876. During that year 100 pounds of comb-foundation were sent out from Medina to beekeepers throughout the country for experimental purposes.

The enthusiasm with which this new product was received and tried out gave a new impetus to comb-honey production. Instead of several combs in a box, as in the box-honey era, comb honey was at this time produced in single comb boxes and sheets of comb-foundation were used to guide the work of the bees. In regard to the effect of the invention of comb-foundation upon the construction of the beehive, A. I. Root wrote as follows: "Our friend Dean said a few days ago that if he were going to raise comb honey he would unhesitatingly adopt the shallow Langstroth frame, although he has been one of the strongest advocates of the Gallup frame. Just what effect the artificial bleached wax-comb is going to have on the shape of the hives, we are un-



Apiary of box hives. The way all bees were kept in the old days.

able to tell, but there can be little doubt that it will turn many others, like friend Dean, toward the Langstroth frame and two-story hive."—(Gleanings in Bee Culture, Vol 4, p. 26). During the year 1876 neat sections, made of four pieces, but otherwise similar to the comb-honey sections of today, were evolved from their crude prototype, the single comb boxes or frames which had been used by some beekeepers previous to the introduction of comb-foundation.

Comb-honey production now became so attractive that within a few years beekeepers talked and wrote chiefly in terms of comb honey. The exacting requirements of successful comb-honey production made it necessary for beekeepers to study their problems as never before. This is reflected in the beekeeping literature of the time giving it a brilliancy peculiar to the comb-honey era. Such leaders as Doolittle, Hutchinson, Heddon, Taylor, and our own Dr. Miller, together with many others, were the product of the earlier struggles with the multitude of baffling problems connected with comb-honey production. In turn they have left an everlasting impress upon the industry through the literature of the time.

Early in the comb-honey era there was a rapid ascendancy of the Langstroth frame and the abandonment of the deeper frames by most comb-honey producers. This was followed by another change in the hive—the reduction in the size of the brood-chamber. Doolittle, one of the few comb-honey producers who retained the deep frame, reduced the standard Gallup hive from twelve frames to nine frames. Heddon and others reduced the Langstroth brood-chamber from ten frames to eight frames. The literature indicates clearly that these changes were made because of the peculiar requirements in comb-honey production, that the brood-chamber be filled with brood at the beginning of the honey flow and a sharp dividing line maintained between the brood and supers during the honey flow.

The change to comb-honey production had brought back the swarming problem, the solution of which had its effect in a further reduction of the brood-nest when hiving swarms. In the clover region swarming usually occurs during the honey-flow, which formerly meant a loss of the crop of honey during ordinary years from all colonies that swarmed. In order to prevent this, beekeepers learned to hive the swarm in a new hive on the old location, leaving the parent colony close beside the swarm until about the seventh day, when it is moved away. This drains the parent colony of its field bees, adding them to the swarm, and at the same time so reduces the colony that after-swarms are prevented. The supers were transferred from the parent colony to the swarm at the time of hiving. In order to compel the bees to put practically all the honey into the supers, the brood-chamber was contracted by means of heavy division boards.

Doolittle described this method of securing large crops from swarming colonies in February, 1885, as follows: "I use six Gallup frames of comb (equal to five Langstroth frames) for the very largest swarms, while others have four or five, according to the size of the swarm to be hived, and in this way I always secure good results."—(Gleanings in Bee Culture, Vol. 13, p. 94).

In July, 1885, Mr. Heddon published an article in the American Bee Journal on "The Contraction Method," in which he advocated that the colonies be maintained on five combs throughout the year, except during the six weeks just preceding the honey flow, when they were given three extra combs to induce the rearing of more bees for the honey flow. In this connection he wrote: "I have had colonies, after casting three swarms, at work in the supers within five days after contracting. I think that the advantages of this contracting system will be seen; or it may be called an enlarging system; that is, enlarging the brood-chamber for about six weeks during the time that the queen is not only the most prolific, but when such prolificness gives us bees to become field workers, just when we most need them."—(American Bee Journal, Vol. 21, p. 437).

The proper capacity of the brood-chamber was thought by many beekeepers at this time to be five Langstroth frames, except during the short period mentioned when the brood-chamber of the strongest colonies was expanded to eight frames. The contraction system came to be used not only when hiving swarms, but was used on established colonies as well. Contraction of the brood-chamber, the use of the queen-excluding honey-boards, and reversing or inverting the brood-combs to cause the bees to take practically all the honey to the supers, became quite the fashion for several years among the leaders at this time. Even Dr. Miller wrote: "Up to the time of putting on supers, the desire has been to have the bees occupy as many combs as possible. I have had as many as nine frames occupied with brood, without my spreading the brood, or doing anything to urge the bees or queen further than to see they had abundant stores. When it comes time to put on supers they are reduced to four or five frames."—(C. C. Miller, 1885, "A Year Among the Bees," p. 419).

(To be Continued)

Specific Gravity of Honey

By F. Dundas Todd

THE Beekeepers' Association of British Columbia for several years has arranged with Mr. J. A. Dawson, head of the Dominion Department of Trade and Commerce, Vancouver, to test the density of all honeys entered for competition at the Vancouver Agricultural Exhibition, the tests being made by means of an Abbe refractometer. At the last exhibition he remarked that a sample of honey shown by Mr. L.

Harris, Vernon, one of our bee inspectors, with a refractive index of 1.5008, indicating that it contained 84.62 per cent of solids, and had a specific gravity of 1.443, was the densest honey he had ever tested. Here are a few others of his readings on that occasion, just to show the variations in density. They were not chosen at the time to show high density, but for quite another purpose, so I quote them as they are, the only readings I happen to have:

Sp. Gravity.	Solids.
1.443	84.62
1.4400	84.39
1.4333	83.23
1.4305	82.81
1.4281	82.46
1.4189	81.08

The Dominion standard for honey is 1.3790 ————— 75.

My own honey, which is principally from wild fruit blossoms and is sealed for at least a month before being extracted, shows about 81 per cent solids; that is a specific gravity of 1.418.

I notice in the issue for May of the American Bee Journal that Mr. Isaac Hopkins gives 1.420 as the minimum specific gravity officially accepted by the New Zealand Government graders, and states that no honey of lower specific gravity is allowed to be exported, or accepted by the Co-operative Honey Producers' Association. Our experience at Vancouver would indicate that this is a very high standard, and I wonder whether a reading by Mr. Dawson of one of New Zealand's minimum standard samples would be as high.

A rather interesting and practical feature developed this past season. The three older of British Columbia's half dozen bee inspectors were acting as judges, and the idea struck them to check up the "capsizing" way of testing comparative densities with Mr. Dawson's figures, just to see how it would work out. In the capsizing method one takes a jar of honey in each hand, then turns them upside down at the same instant, and watches the air cells rising. The quicker the cell arises, the thinner the honey. I am glad to report that when the honey is free of any granulation the method is reliable as a comparative test, and enables the judges to quickly arrange the honeys in order of density. I have also learned that not infrequently there is quite a variation in the flavor, density and color of honey in the same exhibit. This does not surprise me, because when I extract in August I know I have quite a percentage of honey that was sealed early in May, so a dozen jars filled from one run of the extractor are found to be streaky.

Victoria, B. C.

Minnesota Report

The fifth annual report of Charles D. Blaker, State Inspector of Apiaries of Minnesota, is ready for distribution. Minnesota beekeepers desiring this report should address Mr. Blaker at Minneapolis.

AMERICAN BEE JOURNAL

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The oldest Bee Journal in the English language.

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THE EDITOR'S VIEWPOINT

Good Samaritan and Other Funds

As stated in the April number, the total amount sent to France, the past month, representing all subscriptions to that date, was 10,073.37 francs. This includes the following subscriptions received at Buffalo:

Miss Favard, Chicago	\$ 5.00
E. G. LeSturgeon, San Antonio, Texas	5.00
A. J. Odell	1.00
C. F. Muth, Cincinnati	5.00
Griggs Bros., Toledo, O.	5.00
B. F. Neach	2.00
L. K. Edgett	2.00
R. C. Whitman	.50
A friend	5.00
F. W. L. Sladen, Ottawa	2.00
F. B. Paddock, Ames, Ia.	5.00
J. J. Anderson, Idaho	1.00
W. L. Coggsall, Groton, N. Y.	2.00
E. W. Gutekunst	2.00
B. F. Kindig, East Lansing	1.00
A friend	1.00
Riverside Co., Beekeepers, Calif.	52.00

Total \$96.50

Funds are still coming, so we begin a new list as follows:

L. C. Rousseau, Waxahachie, Tex.	\$1.00
L. K. Hostetter, Lancaster, Pa.	5.00
O. W. Bedell, Earlville, N. Y.	5.00
Emma L. Compton, Randolph, Mo.	5.00
G. A. Bahn, Austin, Texas	5.00
J. C. McCubbin, Fresno, Cal.	10.00
F. Kittinger, Franksville, Tenn.	5.00
Jacques Verret, Charlesbourg, Quebec	2.00
Roy Tait, Siskiyou, Cal.	1.00
A. Norton, Monterey, Cal.	2.50
Leon L. Jaquemin, Solidad, Cal.	2.00
G. B. DeSellen, Los Angeles, Cal.	1.00
A. Stevenson, Los Angeles, Cal.	.50
Ferd Hanson, Los Angeles, Cal.	1.00
S. S. Knabenshue, Los Angeles, Cal.	.50

Total to April 12 \$46.50

The last 7 names came through J. E. Pleasants.

Austrian Food Orders

The Society of Friends have discontinued their Paris agency, so the funds have been put into the hands of Messrs. Crepieux-Jamin, Tombu and Outhelin, the local Franco-Belgian committee. They are to send instructions as to the delivery of the goods.

The "food orders" sent to the starving editors at Vienna were subscribed as follows:

A friend, of Canada	\$5.00
E. G. LeSturgeon	5.00
S. D. House	5.00
C. F. Muth	5.00
R. C. Whitman	.50
F. Rauchfuss	1.00
E. W. Gutekunst	2.00
B. F. Kindig	1.00
C. J. Baldrige	2.00
A friend, Michigan	1.00
F. C. Pellett	3.00
O. W. Bedell	2.50
C. P. Dadant	7.00

Total: Four food orders sent \$40.00

Queens and Queen-Breeders

The American Bee Journal is already receiving some complaints concerning queen-breeders. Not that they have failed to fill the orders, for it is yet too early, but that they are not answering as promptly as expected. Many buyers fear that there will be

trouble, as there was last year, in securing queens.

In our August number we gave a lecture to both buyers and sellers. Another lecture may be needed.

The man who breeds queens for sale must be a reliable man. He must be prompt in acknowledging receipt of money and either give a direct promise of delivery of such queens as the customer wants, or state his reasons for not making promises. If he cannot make sure of filling the order, he should keep that money where he can promptly return it in case of failure. He must put himself in his customer's place and realize that it is a great disappointment to pay one's money for goods and fail to get them, or get them too late.

On the other hand, as I have myself bred queens for sale in the long ago, I have much sympathy for the man who is making honest efforts to supply queens when the season is backward. The man in the North, in Iowa, for instance, who sees a heavy snow fall when he thought winter was over, and who reads of frosts in Dixie at a time when frosts are no longer expected there, must certainly comprehend that the queen-breeder is as much disappointed as he may be himself; that if he has promised queens for May 1, he may be unable to have them, no matter how strenuously he tries.

Meanwhile we demand of those who advertise in our columns that they furnish good queens, at the dates agreed, or return the funds received. But we hope the buyers will be lenient when unexpected irregularities of the weather, delay the shipments unexpectedly. As we said last year, queens are not kept in a bushel box, ready for delivery by return mail. Let us give and take. The golden rule is, as elsewhere, applicable to both sides. But dishonest breeders should be at once eliminated.



Mrs. Baldensperger preparing to hive a swarm.

Disulphide or Bisulphide and Moth Eggs

In the March number, page 90, following Mr. Pangburn's letter on carbon disulphide and the killing of the eggs of the moth, we asked for more information. We received it. In fact we received too much of it, on both sides of the question. So we concluded to refer the matter to Dr. Paddock, whose experiments on this subject were published in Bulletin 231 of the Texas Experiment Station. It will be remembered that, in all his experiments, the eggs of the moth were uninjured by the fumes. We now publish a part of his reply and will close the subject:

"My experience with the moths was in the South, where conditions are very different from those existing in this section. In Bulletin No. 231 of the Texas Experiment Station, you will note that on 3 different occasions the eggs of the moths hatched after fumigation. We kept no records of variations of temperature and humidity. The killing power of carbon bisulphide is much reduced in low temperatures.

"The dose of one ounce to the cubic foot, used in the experiment, is an excessive dose of bisulphide. An exposure to this charge for 24 hours is also a maximum exposure.

"I have no doubt but that under ideal conditions and the use of an excessive dose of carbon bisulphide the eggs of the bee both can be destroyed. In the experiment which we conducted we attempted to keep the work on a practical basis, therefore, it seemed more feasible for us to fumigate two times with the dose sufficient to kill the unprotected larvæ, rather than to use an excessive dose for the eggs. We are fully familiar with the exceptional cases, but I believe it is better to make recommendations on the basis of the ordinary fumigation than the exception. The temperature factor is of utmost consideration in this territory; for instance, if the fumigation was given during the winter, the carbon bisulphide would not be very effective. Under low conditions if the eggs have a retarded hatching they might hatch in the spring. The beekeepers might consider this a matter of infestation.

"I believe that it would be unwise to make any conclusive statement."

F. B. PADDOCK.

European Foulbrood

At the National meeting at Buffalo, Dr. Phillips gave a very interesting address upon the general tendency of European foulbrood to extend itself and perpetuate in some spots, while it readily disappears in other spots.

From his explanations, accompanied with maps, it appears that the disease is persistent in countries where there is a long spell of spring or early summer weather without honey flow. So in the buckwheat district of New York, where the flow comes in August, the disease is more permanent. Good food evidently would tend to lessen the virulence of

the disease. Similarly, the places where much moisture is found, with numerous fall flowers, such as the Kankakee swamps in northeastern Illinois and northwestern Indiana, the Mississippi low lands as far down as Louisiana, have more to fear from an epidemic condition once the disease is established there.

On the other hand, the limestone regions where white clover succeeds well, get rid of the disease readily. Texas has apparently had two or three disease spots, which cleared readily without treatment.

Such statements are valuable in helping find, sooner or later, the actual causes of bee diseases. We are pretty nearly as ignorant as children on these matters, and we will have to go to school a long time before we can master the question of brood diseases.

A very good point, also, was made in the statement that small hives are less immune than large hives. This is plausible, since colonies in small hives never can be as populous as those in large hives. Tally one more point for the large hives.

Another point is made for the Italian bees, who get rid of the disease much more readily than the common bees.

American Foulbrood

Another very good Bulletin of the Department of Agriculture, No. 809, on "American Foulbrood," by Dr. G. F. White, has been published lately. It is quite exhaustive, contains all the latest experiences of this scientist, with 8 plates showing the disease at different stages and microscopic studies of "Bacillus Larvæ," the cause of the disease. It may be had from the Bureau of Entomology at Washington in the usual way. Beekeepers who fear the disease should send for this Bulletin.

An Apology

On page 49 of the February number, we complained of the borrowing of an article by the British Bee Journal without giving us credit. We now learn that it was an oversight on their part. We should have surmised this at first, as we ought to know they would not intentionally do such a thing. We apologize for the criticism.

Swarms From Large Hives

On page 6 of "A Manual for an Easy Method of Managing Bees," published by John M. Weeks, Salisbury, Vermont, in 1837, we read:

"The lower apartment of the hive, where they store their food, raise their young bees and perform their ordinary labors, should hold as much as a box 12½ or 14 inches square in the clear. If the hive is much larger, with the chambers in proportion, which should hold about two-thirds as much as the lower apartment, the bees will not be likely to swarm during the season. Bees in large hives never swarm. . . ."

It seems that some people had already noticed, as early as 1837, that bees in large hives did not swarm as

much as those in small hives. Yet some beekeepers of the present day would like to convince us that the size of the brood-nest has nothing to do with the swarming propensity.

Wiring Foundation

In the present number we give two more articles on wiring foundation. While we do not wish to certify that there is nothing more to be said, we know these are both practical men and worthy of hearing. Before long the average beekeeper will know positively how to fasten foundation so that it will not sag at all.

Death of Another Bee Woman

We regret to announce the death of the wife of our old correspondent, Ph. J. Baldensperger, the former Holy Land apiarist. Debora Struve was born at Buffalo, N. Y., November 26, 1861. Married to Ph. J. Baldensperger in 1884, in Palestine. A silent woman apiarist, whose name never was published, but who, nevertheless, worked faithfully and persistently at the apiary.

In British Columbia

Bulletin No. 30, "Guide to Beekeeping," of the Department of Agriculture of British Columbia, by F. Dundas Todd, is a 68-page treatise, with numerous engravings, neat and clear in type, covering practically the entire field in a nutshell. We presume that it is sent free to the British Columbia beekeepers. It is worth having.

Centenary of Hruschka

L'Apicoltore of December last informs its readers that this year occurs the centenary of the birth of the inventor of the honey extractor, Hruschka. He was born in 1820. He invented the extractor in 1865, or about that time. This invention, which has enriched beekeeping, never brought him a cent of profit, for he took no patent on it, but gave it freely to the world. He was certainly one of the benefactors of mankind.

Illinois State Association

The secretary of this association, G. M. Withrow, Mechanicsburg, Ill., announces a bulletin to the members, to be published monthly or quarterly. This has already been done by the Michigan Association, and is a good move. Send your membership dues to him. It will entitle you to this quarterly, the State Annual Report and a year's subscription to one of the three leading bee magazines, American Bee Journal, Gleanings or Domestic Beekeeper. Fees \$1.50.

MOVING BEES A LONG DISTANCE

How 600 Colonies of Bees Were Moved From Kansas to California in a Freight Car

By Roy Bunger

Following the failure of our honey crop last year, we were more than ever anxious to move to California, as many another beekeeper has done.

We began moving our yards (nearly 600 colonies in 10-frame hives) near town about October 1, and had only about 100 colonies placed there when the inspector, Mr. Whitehead, arrived to begin inspecting. This work took up 10 days of our time.

We finished hauling all healthy colonies near town, united about 40 of the weaker ones, finished up the usual routine of preparing them for winter, about November 1. On account of the high freight rate on an automobile we decided to drive the one through that we used in this work, a Dodge Commercial, which weighs 2,600 pounds.

The freight rate demanded on this car was \$7 per 100 pounds, so it would have cost about \$182, but even at this rate I am not sure but it would have been cheaper by freight than by driving it through as we did.

We left our old home at Eskridge, Kans., November 3, and drove overland, arriving in San Bernardino about November 18. We came over the National Trail, which was very rough.

After visiting friends and relatives, and attending the short course for beekeepers, I found Mr. B. F. Stanley, County Inspector of San Bernardino County, who accompanied me to help find a location. To eastern beekeepers this might seem like an easy matter, but in a county of over 50,000 colonies it is not so easy as it seems.

I left San Bernardino December 12 and arrived at Eskridge three days later, where work of making moving screens was immediately begun. The

thermometer was hanging around zero at this time, hives were covered with layers of ice, which was quite a change from California orange blossoms.

It was necessary to get part of the wooden material for these frames from a factory at Riverside. The material for these frames is very light and cost 5 cents each here. It was necessary to ship this material to Kansas by express, which cost over 10 cents for each frame, which is another case of transportation costing more than double the original value of the article.

I used the ordinary pearl screen for this frame, which I made by nailing together two sides and two ends, then tacking a screen on this, and next laying four more strips on this in such a way as to cross ends. Then nail these strips on the frame so the edges of the screen will be held by the nails, also by the upper and lower half of the frame.

This work was completed just before Christmas. The screens were nailed on the hive-bodies with four 6-penny nails, then the covers placed back on the hives. Christmas day we placed a slat entirely over the hive entrance, closing this very tight. Before doing this it was necessary to scrape the ice away from each entrance, as the thermometer was still hanging near the zero mark.

On the following day we hired a large truck and began hauling bees to the car, 48 colonies to each load.

The accompanying photograph shows the truck being loaded. The entire car was loaded before night.

These hives averaged 58 pounds each as they were hauled to the car.

The weather turned suddenly warm that day and the bees were badly in need of a flight, as some colonies were badly affected by dysentery, due to poor stores. The following day we began loading another car with emigrant movables, also including over 1,000 supers, mostly drawn combs, which filled over half of a 40-foot car. The other half of the car was loaded with bee supplies and fur-

niture, and last the family cow was loaded in a small space between the doors. We were ready to start on the long trip by freight, which required eleven days.

I left Eskridge December 29 and arrived at Upland January 9. The following day we were ready to begin unloading early, but the agent refused to allow anything unloaded till he could get the freight rate from headquarters at Los Angeles. This he failed to do till nearly noon, which was very bad for the bees, as the weather was very warm here. They were given plenty of ventilation in loading, the car being 8 ft 7 in. inside width by 40 ft in length.

On account of scarcity of box cars it was impossible to get a ventilated car, so it was necessary to keep the doors open at all times. For this reason it is necessary for a person to be in charge of every car of bees. These hives were loaded lengthwise in the car, which was wide enough to allow a small air space between each of the 6 hives which were placed in each row, after the cover and inner cover had been removed.

I had purchased rough, heavy fencing boards and had them sawed in 2 strips at a mill, then sawed them just the right length to fit in the car crosswise, 2 strips being placed over each row of hives and nailed to the hive bodies to prevent shifting. Another row of 6 hives was then placed on these and strips on top of this row, nailed as the others had been, till they were stacked 5 high in rows all over the car. They were fit in so tight no hive could shift lengthwise. As all hives are exactly alike this was an easy matter. There was no loss in shipping, every colony came through alive.

Our bees are doing well and on this date (March 7) have many colonies working in supers; also quite a number of young queens laying, which we have reared since coming here. The cost for truck hire was \$45; freight was \$1,107.87.

California.

Killing Wax Moth

W. S. Pangburn, on page 90, March number of the American Bee Journal, on the use of carbon disulphide for killing eggs of the wax moth, requires too much labor and material for economy. While I don't know whether by my method I kill the eggs or not, I never treat but once, and when treated combs are properly covered; they have never needed any further treatment. My management consists of a galvanized iron can 18x22 inches by 6 feet deep, and a pan 20x24 inches by 2 inches deep. The pan is set on the ground and leveled, with about 1 inch of water in it. Two small sticks are placed in the pan to pile the hives or supers on to keep them out of the water.

The combs to be treated are piled as high as the can will cover, no attention need be paid to tight joints between hives.

About a tablespoonful of carbon disulphide is poured over the tops of



Roy Bunger and the car he drove through to California

the frames over the upper section, a super cover immediately placed over it, and the can inverted over the pile by means of a small rope attached to the upper end of can and a pulley fastened to some support.

The lower or open end of can rests in the pan of water, closing it absolutely air tight.

I don't know how long it is necessary to leave them covered for perfect results. I have never known worms to hatch in combs that were treated for four or five hours, and properly piled away and covered. I sometimes leave combs in all night, or take them out at my convenience.

Whenever I find combs becoming wormy, I "run them through the can," and that ends it, with me.

E. L. HALL.

Michigan.

Wisconsin Establishes Legal Honey Grades

By S. B. Fracker

Acting State Entomologist of Wisconsin

Almost the first agricultural industry to take advantage of the establishment of State marketing facilities in Wisconsin was that of beekeeping.

The last legislature created a division of markets for the grading of all agricultural products and finding markets for them. The honey producers said, "Here is something we have been needing a long time. Let's take advantage of it." Resolutions were consequently passed at the State beekeepers' convention in December asking the division of markets, the crop reporting service, and the State Entomologist to co-operate in providing information which would result in improved marketing facilities for the State's annual honey crop of about 4,800,000 pounds.

The plan worked out includes monthly crop and price estimates during the summer and fall, the establishment of legal compulsory grades, and the help of the division of markets in locating markets for honey.

For establishing standards for grading, a marketing committee was appointed by the beekeepers, and a set of proposed grades was drawn up by them. The division of markets held hearings on the subject in several places in the State. Many beekeepers who were unable to attend the meetings wrote out their suggestions and mailed them to Madison.

A surprising feature of the hearings and correspondence was the fact that no opposition to the establishment of grades was expressed by anyone. Several were anxious to be permitted to sell all or some honey ungraded, but none were opposed to marking it so. For the small beekeeper who does not wish to grade his honey, a rule that every such section or can shall be marked "Ungraded" with a stamp or in any other convenient way, relieves the regulations of any possible burden.

Grades have now been defined and will go into effect on August 13, 1920. After that date every section of comb

honey and every can or other container of extracted produced in Wisconsin and sold or delivered within the State or outside, must be stamped or labeled with the grade, and color of the honey and a number showing the producer or packer, or else be marked "Ungraded."

The grades established are expected to result in improving the quality and finish of Wisconsin honey and to put a premium on care in handling it. Too often "honey is honey," especially on the retail market; the storekeepers buy wherever they can for the lowest price and sell for all they can get.

Every beekeeper who wishes to sell or deliver any honey under these grades is required to secure stamps from the division of markets. These will be purchased wholesale and supplied at cost. Numbers will be assigned by the division in the order of receipt of the applications. Each beekeeper will then be responsible for the accuracy of the grade label on every container on which his number is used.

Many beekeepers will sell their product "ungraded" and label it so for the next year or two. But it has been the universal experience that marketing a first-class product "Fancy" or "No. 1," so extends the market and increases the demand that undoubtedly all commercial producers will register with the division of markets and secure the right to grade their honey within a couple of seasons.

A problem faced in establishing standards was the fact that improper labeling would subject the offender to a fine. It was thus necessary to define the grades much more clearly than the honey associations do, assigning a definite meaning to such expressions as "well-filled," "firmly attached," and "uniformly colored," which never seem to have been defined before.

Under the statute providing for grading, such classes as "Not permitted in shipping grades," cannot be established, but unmarketable honey is covered in the definition of "good quality" in such a way that it must be sold "ungraded" if at all. If unfit for human food, of course, it comes under the food laws.

The grades outlined differ from the Colorado rules in providing for grading finish as distinct from color, but

closely resemble the standards adopted by the National Beekeepers' Association in 1913, except in the provision of a minimum weight for each grade. The letters in parenthesis in the following outline of the grades as finally established, refer to the definitions at the close of the grading rules.

Wisconsin Fancy

Honey of this grade produced in Wisconsin shall consist of (a) good quality comb honey in the different (b) colors known by the terms Water White, White, Light Amber, Amber and Dark; in which sections are (c) well filled and (d) well cleaned and the combs (e) firmly attached, (f) not projecting beyond the wood, (g) uniformly colored throughout, (h) evenly capped and entirely sealed except the cells in the outside row next to the wood, which may be unsealed. No section in this grade is to weigh less than 13½ ounces gross or 12½ ounces net.

Honey packed for sale under this grade shall be in new best grade sections weighing not more than one ounce and be packed in new cases. Each section and case shall be stamped with the official stamp (Wisconsin Fancy), stating color and packer's number.

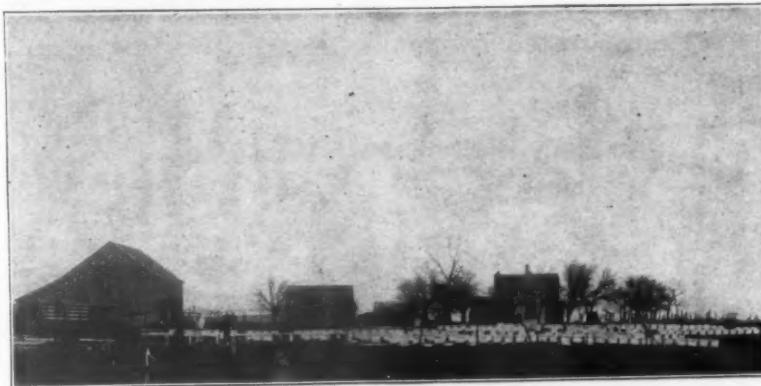
The front sections in each case shall be a true representation of the contents of the case.

An official stamp will be furnished by the Division of Markets at cost.

Wisconsin No. 1

Honey of this grade produced in Wisconsin shall consist of (a) good quality comb honey in the different (b) colors known by the terms Water White, White, Light Amber, Amber and Dark, in which the sections are (c) well filled, (d) well cleaned and the combs (e) firmly attached, (f) not projecting beyond the wood, and entirely sealed excepting that not more than six cells on each side, in addition to those of the outer row next to the wood, may be unsealed. Slight travel stain and slight irregularities on the surface are allowed in this grade and not to exceed ten cells on each side may contain honey of a different color. No section in this grade is to weigh less than 12 ounces gross of 11 ounces net.

Honey packed for sale under this grade shall be in new best grade sections weighing not more than one



The bees had all been brought to one yard near the railroad. From here they were hauled to the car with a big truck

ounce and be packed in clean cases. Each section and case shall be stamped with the official stamp (Wisconsin No. 1), stating color and packer's number.

Wisconsin No. 2

Honey of this grade produced in Wisconsin shall consist of (a) good quality comb honey in the different (b) colors known by the terms Water White, White, Light Amber, Amber and Dark; in which the combs are (f) not projecting beyond the wood, are attached to the sides not less than two-thirds of the way around, and are entirely sealed excepting that not more than a total of 60 cells in addition to those of the outside row next to the wood may be unsealed. Where 20 per cent or more of the cells contain honey of a darker color than the remainder, the sections shall be marked with the darker color. Honey in badly stained and propolized sections is not permitted in this grade. No section in this grade is to weigh less than 11 ounces gross or 10 ounces net.

Honey packed for sale under this grade shall be in sections weighing not more than one ounce and be packed in clean cases. Each section and case shall be stamped with the official stamp (Wisconsin No. 2), stating color and packer's number.

Ungraded

Comb honey may be packed for sale without conforming to the requirements for Wisconsin Fancy, Wisconsin No. 1 or Wisconsin No. 2, provided that it is stamped or marked "Unclassified" or "Ungraded."

Wisconsin No. 1—Extracted

Honey of this grade produced in Wisconsin shall consist of (a) good quality extracted honey in the different (b) colors known by the terms of Water White, White, Light Amber, Amber and Dark. The honey shall weigh not less than 12 pounds per gallon at 60 degrees Fahrenheit.

Honey packed for sale under this grade shall be in new containers.

Each container must be stamped with the official stamp (Wisconsin No. 1 Extracted Honey), stating grade, color, net weight and packer's number.

An official stamp will be furnished by the Division of Markets at cost.

Ungraded

Extracted honey may be packed for sale without conforming to the requirements for Wisconsin No. 1-Extracted Honey, provided that it is stamped or marked "Unclassified" or "Ungraded."

Explanations of Grade Requirements

(a) "Good quality" comb honey means honey which is commercially salable, not containing pollen or honeydew, not extensively granulated, poorly ripened, sour or weeping, and not in leaking, injured or patched-up sections.

"Good quality" extracted honey means honey which is not sour and has not been contaminated by honeydew, excessive use of smoke, dirt or foreign materials of any kind.

(b) "Color"—The color standards of the Root honey grader shall be deemed official for determining color of comb or extracted honey. The five official colors are Water White, White, Light Amber, Amber and Dark.

(c) "Well filled" means 80 per cent of area within the sections shall be occupied by sealed cells.

(d) "Well cleaned" means free from propolis or other stain.

(e) "Firmly attached" means that the comb shall be attached to wood sections at least 85 per cent the way around.

(f) "Not projecting" means no part of the comb shall project beyond outer edge of section.

(g) "Uniformly colored" means that all the cells contained in any section shall be of the same color.

(h) "Evenly capped" means combs shall be free from pronounced irregularities in the surface.

(i) "Well strained" means honey

which does not contain particles of wax or other materials which will not pass through two thicknesses of cheese cloth.

A Sugar Report

We have just received the annual report of the American Sugar Refining Company for 1919. It has 44 pages and contains, besides a financial statement of interest to stockholders of the company, general information which may be of interest to our readers.

Among other things it is stated that the United States consumed 16 per cent more sugar in 1919 than in 1918, the consumption reaching over four million tons, for the first time in the history of the country. This sugar came from the following sources:

Cuban cane sugar, two million tons.
U. S. beet, one million tons.
Hawaiian cane, one-half million tons.

Porto Rico, one-fourth million tons.
Louisiana, etc., balance.

The total production of sugar for the year 1919 was over 16 million tons, contributed by countries in the following order of importance. Cuba, Europe, British India, Java, United States, Hawaii, Japan and Formosa, Porto Rico, etc.

It will be seen that Europe is in second place, whereas, previous to the world war she produced over half of the world's sugar.

The report predicts that with the resumption of normal in the European countries, which may take several years, there will be keen competition in the sugar markets, which should bring prices to the American consumer down to a much lower level. Prices have already dropped considerably.

In 1900 the American Sugar Refining Company had 60 per cent of this country's sugar business. It now has but 27 per cent. M. G. D.

Twentieth Century Marketing Methods

Read at the National Meeting by Chas. B. Justice.

The experiences I have had, in organization and in marketing, have convinced me of the absolute necessity for up-to-date information at all times. All knowledge is merely accumulated information. Information in marketing can be provided in the form of statistics after the season's operations are over, or sufficiently in advance of shipment to guide producers in their marketing efforts. It cannot be provided, however, without an organization delegating power and authority in the hands of those chosen to secure and disseminate this information.

It is clear to all that beekeeping problems in the East are dissimilar to the problems in the West, and it is not likely that Eastern beekeepers will support any project which has for its principal object marketing. All this was kept clearly in mind when, at the Kansas City conference, it was



Ready for a Sunday Drive.

decided that the American Honey Producers' League must be organized to operate along lines of common interest to beekeepers everywhere, and not upon lines which serve the beekeepers of one community or section better than those of another. I believe I speak the sentiments of all present at Kansas City when I say that the two principal functions which the League hoped to accomplish were, first, a stimulus to organization among beekeepers everywhere, and, secondly, a prompt securing of information with respect to movement of crops and a distribution of this information to all beekeepers, thus guiding them sufficiently in advance of the movement of their crops to enable them to act intelligently in their marketing. The beekeepers are not now apprised of the annual production, of its distribution, of its quality nor of the price at which it is sold.

The beekeepers of New York and all eastern sections are interested to know just what the annual production of the tremendous western areas will be, each year, and they would like to keep informed of the grades established in the west, of the movement of these crops on to the market, to which markets they are being principally sold, in what sized packages moved and at what prices. This information is vital to them and they will support within a reasonable cost any bureau or organization which necessitates the expenditure of lots of

Twentieth century marketing methods have brought about just these conditions in many food-producing lines, hence this is no experiment except in the sense that it was to be achieved in a manner strictly co-operative. The same result is being accomplished by large organizations everywhere who are affiliated together through a common sales agency. The lack of information among producers is responsible for needless competition in the manner of price cutting, glutted markets and ruinous carry-overs. With advance information at hand, the beekeeper is provided with up-to-date tools and avoids these needless and fatal mistakes.

The first steps toward ideal conditions appear to be the formation of strong and closely knitted state or regional organizations, so that the goal of national organization may be ultimately and more quickly reached. We hope that 1920 will bring about a better understanding of the inter-dependency of the beekeepers of the East and those of the West, and that a common sympathy will spring up between them upon the objects they have in common, that the human doubts, distrusts and suspicions which hold back mankind from achievement will give way to a sincere, warm-hearted determination to work hand in hand for the emancipation of the industry.

The incentive is much. We hold in our hands the destiny of the beekeeping fraternity. Our product is without a peer. None can control it except ourselves. All forward-looking

men and women of strength and courage should take hold and build up organizations which can later sweep them on to prosperity and success through a widened channel or outlet for their products.

The beekeepers of the East will realize that the large organizations of beekeepers in the West are, through twentieth century methods, standardizing their packages and grading their products, giving them an appeal to the buying public in a volume heretofore unknown; that they are widening their channel of outlet, creating new markets and securing to themselves a better price by the elimination of the speculative buyer, and they will, we believe, accept our view that the better prices, secured by us, give them at the same time a wider consumption of honey and equal chances to benefit in this whole situation. We shall be glad to know that the beekeepers of the East accept this view and that they will be joining henceforth more actively in our councils and in our future co-operation.

California.

The Motor Truck and Outyard Beekeeping

By C. W. Aepler

A motor truck is now considered an essential in outyard beekeeping. The selection of a motor truck on the part of the beekeeper is sometimes a rather difficult task. Those who are operating upwards of one thousand colonies sometimes advocate the use of a large truck, with a capacity of 2 or 3 tons. But even then, such a truck is supplemented a large part of the year with a lighter machine, the operating expenses of which are much less.

A beekeeper with only one or two outyards may find a common roadster type of automobile, provided with a suitable platform, sufficient for his needs. However, the time may pre-

sent itself that the beekeeper's needs are increased, and that such a machine is no longer of sufficient capacity to haul large loads of supers.

When this time comes there are two things that may be done. He may purchase a truck to be used entirely for hauling purposes, and retain his roadster for family use, or he can convert his roadster into a truck capable of hauling a ton or more. If he does the former, it necessitates the investment of considerable additional capital; if he does the latter the thought at once is in his mind that his machine will be too unsightly for pleasure driving or taking his family to church on Sunday.

Assuming that most beekeepers are situated as I am, the latter would seem the more logical. My idea of a motor truck for outyard work is one in which there is the minimum amount of fuss, such as rope tying, which one so often has the opportunity to see. Where one wishes to haul supers full of combs over all kinds of roads, it is almost impossible to tie them on in such a way that they will stay on. Furthermore, this tying of ropes necessitates the expenditure of lots of time. Also at the outyards it is not much fun to tie ropes when hauling supers of honey. All of this extra fuss excites the bees to robbing, because of the probable exposure of supers of honey. Sometimes the hauling is done in the evening, and if the beekeeper must fumble around in the dark, tightening ropes, his temper is apt to be anything but sociable.

My idea of such a truck is best shown by the accompanying photographs. The side-board arrangement is based on the old-time method of wagon-box construction. One set of side-boards and one end-board are permanently fastened to the truck floor, and when only a small amount of hauling is done, the truck can be used in this fashion. Also, I don't think that it looks so bad but that



A load of 112 shallow extracting supers ready to go to an outyard.

the family can go to church with it, when so arranged. In hauling full loads of honey one extra set of side-boards is sufficient. When hauling loads of supers full of drawn combs, honey containers, packing for wintering, etc., all three sets of side-boards can be used to advantage. It is only the work of a few minutes to dismantle the truck, and at the outyards it is only the work of half a minute to slip in the end gates after the truck is loaded and one is on the way. There are no ropes to tie—no fuss, no worries about the load being lost on the road.

The side-boards should be made of light lumber, such as white pine. However, the supporting braces should be of hard wood, such as oak or birch. These supports need not be over 2½ inches wide. The end gates are prevented from falling out by a series of cleats, and at the top an iron rod, provided with threads and a wing nut, as commonly used in every farmer's wagon box. Possibly such an arrangement as this will weigh a trifle more than an arrangement whereby the boards are slatted. However, when using slats, the extra braces, bolts and screws to hold them together will almost make up this small extra weight. But even though it does weigh a few pounds more, it is well worth the extra load that must be carried.

It is well to make the box of such a size that it will accommodate a given load of supers without any shifting around. Mine is 66x82 inches inside measurements, which allows a load of 112 shallow supers or a load of 64 Langstroth supers to be taken. Of course, when full of honey such a large load is not possible.

Such a truck body can easily be built by the beekeeper, and the total cost of the material need not exceed \$30 to \$35, based on present prices.

Wisconsin.

How Shall We Wire Frames?

By W. S. Pangburn

The wiring of frames has been in vogue for some time, and it would seem long enough that some method should be adopted as considered *best*.

However, this is not the case, if one is to judge from the different methods that have appeared, and are still appearing in the bee magazines, and from the many imperfect combs found in use by beekeepers.

Some beekeepers seem to think that because they have wired their frames and used full sheets of foundation, they have solved the problem, when, as a matter of fact they may have very few perfect combs.

The extracted honey producer has a much better chance to discover a poor brood-comb than the average comb-honey producer, who has perhaps little chance to see his combs entirely empty. A very poor brood-comb when filled with honey and capped, may put up a very good bluff for a good comb, but when uncapped and extracted, may be a very poor comb, and remind one of the saying that "little smears of powder, and little dabs of paint, make a very pretty thing of a thing that ain't."

Sometimes one is almost forced to believe every beekeeper has a method of wiring of his own, and all give perfect combs, and this is an unfortunate thing for the beginner, who has not had experience enough to sift the good points from the bad.

Some seem to think the more complicated the wiring the better the results; others the fewer wires the better, and both may be wrong, while the beginner, who follows either, may spoil several hundred combs before finding it out.

Some of the methods that have appeared as solving the problem of getting perfect combs through the wiring alone, have been purely imaginary on the part of the introducer, and such things should not be permitted to pass without the proper comment.

It does not matter to the beekeepers who have spoiled enough combs by some of the poor methods given, and have learned enough to reason for themselves, but for the benefit of the beginner, who is looking for some *best* way to wire his combs, and wishing to make no more mistakes than necessary, something should be done.

All we ever see advocated in the supply catalogs, and most of the bee books is the 4 horizontal wires.

That this system has been weighed in the balance and found wanting, is proven very conclusively from the following facts. That grand old beekeeper, Dr. Miller, realized years ago that the system was faulty, and invented and used little wooden splints. Many beekeepers paint the upper part of the foundation with wax just below the top bar, to give the added support, and last, but not least, use

the many different methods of wiring.

What we need to do is to select one of the best, and forget the rest.

Any young beekeeper who reads both *Gleanings* and the *American Bee Journal* for February would be like the editor of *Gleanings*, "between the Devil and the deep sea," when it comes to wiring combs.

To be frank, Fig. 7, in *Gleanings*, reproduced herewith, is, in my opinion, the best system of wiring that has come to light. Any beekeeper who has examined combs for defects, and knows where the defects usually come, and has studied the cause, can see at a glance this plan has some excellent points in its favor. The added support is given where needed, just below the top bar, and in the center.

The loose wiring that was once advocated spoiled more combs for us than any one thing, and I can do no better than quote Morley Pettit in the *American Bee Journal*: "This at one stroke did away with any benefit the wires might be."

Apples fall to the ground through force of gravitation, and combs from too much weight when too tender to bear it. We know they never go up, and we also know they have no other support, usually, than wires, in being drawn. Why, then, do away with the support by using slack wires?

If we were to make any suggestions as to improving the wiring of Fig. 7 it would only be to add a fifth wire. However, this may not be necessary with this system of diagonal wiring, but we have never thought 4 wires enough with the regular horizontal wiring. Not enough support where sagging occurs, and too much buckling between wires at times.

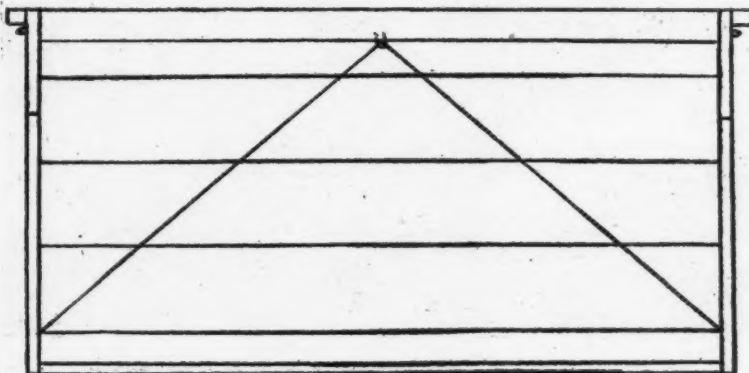
Some beekeepers will, with this method, like some of the others, think it "too much bother." These three words, along with too light a foundation, have spoiled lots of combs. Some beekeepers are proud to tell that they use no wires, and that they are not necessary, and one is reminded of the old adage that "fools rush in where angels fear to tread."

Far too many beekeepers are trying to get along with too little work, and too light foundation, at the expense of the finished product.

Next to a good location and a prolific queen, perfect combs are the beekeeper's greatest asset. A good brood-comb, barring American foul-brood and accident, will last the average beekeeper a lifetime. Can we afford to take chances in some minor matter of wiring, or a slight cost in foundation when so much is at stake?

After the beginner has been given the proper method of wiring he should have equally good instructions as to the proper handling of the frames while being drawn, and afterwards until filled to top bar with brood. Without this precaution they might spoil their combs with most any method of wiring, but this is another subject.

Center Junction, Iowa.



Rearing the Best of Queens for Yourself

Read at the National by Jay Smith

At the risk of being accused of "harping," I am going to state that few of us realize the importance of having vigorous young queens at the heads of all of our colonies. Elisha Gallup said: "Around the queen centers all there is in apiculture." Doolittle said: "Upon no other one thing does the honey part of the apiary depend so much as it does upon the queen." Dr. Miller says: "The queen being the very soul of the colony, I hardly consider any pains too great that will give better queens." Quinby said: "Too much importance cannot be attached to the necessity of keeping each hive supplied with a good queen." Dr. Phillips says: "Unless the queen at the head of the colony is a good one, it is useless to expect that colony to be productive."

We hear a good deal of discussion as to the best strain of bees, and as to the advisability of breeding from the queen whose colony produced the most honey. The question frequently comes up, "Which are best, the goldens, three-banded, or leather-colored?" While all of these are important, yet I believe what is far more important is **how the queen is reared**. To rear the best queens it is important that they must have the best care from the time the larva hatches from the egg until the queen is mated and laying.

The honey producer who raises his own queens has some advantage over the commercial queen-breeder in that as he requires but a limited number, he can choose the time of the year when the honey flow is just right, and he will usually find it practical to introduce the queen-cell to the colony instead of allowing the queen to become mated from a nucleus hive, thus saving the work and expense of nucleus hives and the risk of introducing the laying queen. The disadvantage of this system is that it is necessary to keep the colony longer without a laying queen. But if the cells are produced as the honey flow is coming on, the colony that is made queenless will lose little for the workers that would have hatched if their laying queen had been left with them would not become fielders till after the honey flow was over. Then again, if one should have European foulbrood in the yard, this method of re-queening would be the very best method for eradicating the disease.

I shall not attempt in this short article to give a complete description of queen-rearing, but will dwell upon some features that I believe should be emphasized. For the one who rears over 100 queens per year, I believe, when all things are considered, that the grafting method is to be preferred.

As the honey flow is coming on and the stronger colonies begin to show signs of swarming, and the combs begin to drip nectar when shaken, it is time to get busy at queen-rearing. The method of getting the grafted

cells accepted by the use of the queenless and broodless colony is good, but the swarm box has many advantages, provided you have a good cellar where the bees may be kept warm on cool nights and be kept cool on hot days. As most are familiar with the process of grafting, I will not dwell on that further than to state that I believe much better results will be obtained by the use of royal jelly. Some claim that they get good results without using it, but I never could. The jelly should be diluted with clear water till it is as thin as royal jelly surrounding larva that is just hatched. J. W. George, of El Centro, Calif., informed us that royal jelly can be bottled and kept from one season to the next. I tried this the last season and find it one of the most convenient little tricks of the trade. A shallow screw cap jar with a wide mouth is suitable for storing this jelly. If you have no such jar, you might be able to find one if you rummage around in your wife's manicuring outfit. They usually have these little porcelain jars filled with pink salve or freckle dope or something. You can clean this out and put the contents into a tin can and present same to your wife with your compliments and make off with the little jar. Sterilize it thoroughly by boiling, for the bees seem to object to the smell that comes with it. This jar may be carried in the pocket, together with a jelly spoon, and when you are working among your bees and find any royal jelly, you just pull this jar out of your pocket and can it right there. From a colony that is preparing to swarm you can get enough to graft several hundred cells. For filling the swarm box a tin funnel is convenient. I prefer a swarm box large enough to hold five frames, but only two frames are used. These are placed one at each side, leaving the space in the center to accommodate three grafted cell bars. In filling the swarm box it is well to place it on scales, so that the weight of bees may be accurately known. Between four

and five pounds of them should be used. These must be taken from a strong colony in order that the brood left in the hive will not be neglected. The frame containing the queen is set at the side of the hive and after the swarm box is filled she is placed back into her hive again. This box is filled just before noon and the cells grafted about 4 p. m. Usually the bees confined in a swarm box will not take sugar syrup, but if honey diluted with one-fourth water is given they take it readily. This is given in a Mason jar with perforated cap and is placed in the hole that was used for filling the box with bees. A swarm box prepared in this manner will accommodate sixty cells. It has not been an uncommon occurrence to have every cell accepted and every one finished into long, perfect cells. As a rule, however, we get about 55 accepted and when given to a finishing colony, they usually find one or two more that do not suit them, and they tear them down.

The bees should be left in the swarm box till noon the next day, or they may be released any time during the afternoon of the following day. In the cellar or basement the bees should be kept in the dark. I had a basement made of concrete, and we stacked up extracting supers to the ceiling to keep out the light. A room was made in this way with the opening facing the wall so that no direct rays of light could enter. In this "dungeon" the bees remained quiet and kept right at the task in hand. The best way to get cells completed is over a queen-excluder in a two-story hive with a good laying queen in the lower hive. But in order to get the best results, this hive must be rousing strong. It is well to have both hive bodies **completely filled with brood**. Extracting supers may be put on top of all. This will necessitate some lifting at times, but it is well worth it. One bar of from 15 to 20 cells is given to a colony to be finished. The cells should be left with this colony that finished them



Spring in Tennessee.

until the tenth day after they were grafted. They will then be ripe and will hatch some time late in the afternoon of the eleventh day. These cells should be handled very carefully on the tenth day or cells will fail to hatch, or crippled queens will be the result. The colonies you wish to requeen should be made queenless at least 24 hours before giving them a cell, and if any trouble is experienced from the bees tearing down the cells, they should be made queenless 48 hours. However, if the nectar is coming in and the weather is fine, 24 hours will be long enough. But I can almost hear this question asked: "Why not use a cell protector?" Because if you wish to get the best results in rearing the best queens, you should not use them.

After conducting some experiments along that line, I believe that many do not realize that one of the cardinal points in rearing the best of queens is "proper incubation." To secure perfect incubation of queen-cells the bees must have free access to the cells at all times. Cells will not hatch perfect queens at all times if they are allowed to hatch in cages or cell protectors, for the reason that the bees cannot cluster around the cells and keep the temperature just as it should be. Where the bees have the opportunity, they will closely cluster about the cell and just before the queen is to hatch they will remove the wax, leaving the bare thin cocoon through which the virgin queen may be seen moving about. The cell cannot have this care if placed in a cage or cell protector. Again, it is of the utmost importance to have the virgin queen hatch among the bees, for a virgin that has just hatched is a very frail, weak affair, and needs all the nursing and attention she can get if it is queens of the first quality you are after. The method just described, if properly carried out, eliminates all doubtful features. If it is desired to use nuclei, the same method is employed, only the cell is given to the nucleus instead of to the

full colony. This will necessitate introducing the laying queen to the colony, which is another story. Indiana.

Spring Management of Bees

By Kenneth Hawkins

Spring is the season when the poor beekeeper attempts to remedy his mistakes of the fall before and when the better beekeeper devotes his energy to keep the bees working in the channels of increasing strength, which he provided for in months gone by.

The three prime essentials of spring management which must be supplied to every colony of bees, have been repeatedly emphasized by George S. Demuth as: "Room, stores and protection." The value of these requisites is apparent to every beekeeper who is thoroughly acquainted with what goes on inside his colonies in spring.

These requisites are the means of providing the greatest strength in bees per colony at the beginning of the main honey flow in your locality. No colony of bees can succeed in gathering the maximum yield of surplus honey if they are compelled to use part of the time and nectar of the honey flow in building up colony strength.

Definition of Room and Stores

The amount of room necessary for a colony depends on the strength of that colony. Under better beekeeping methods, spring finds the bulk of the colonies at approximately equal strength. This reduces the labor of spring management. Room in this case means provision for the maximum egg-laying capacity of the queen and such additional room as may be necessary for the first surplus stored for the daily needs of the colony. The trend of modern beekeeping indicates the value of having all this space in one hive body. The "Standard" 10-frame hive body is seldom ample at this time.

Most prolific queen bees can occupy more than 10 Hoffman frames when settled warm weather is imminent, and beekeeping practice with present equipment has worked toward two full brood-chambers for the use of the queen and the storage of the honey necessary for safely providing for the brood.

The amount of stores necessary at this time should be more than sufficient to feed the brood already in the hive for at least a week, in case of inclement weather or failure of the early flows. A larger supply is better. This should probably be the equal of not less than four Hoffman frames well filled with honey as a minimum. Running with less, the beekeeper may have to feed at short notice, and frequently suitable feed is not available.

Uniting Weak Colonies

Where weak colonies are found, they should be united with other weak colonies, until the strength in bees and honey of all the colonies in the yard is nearly equal. The extra queens at uniting may be disposed of at the will of the beekeeper. It should be a very valuable queen to prevent the uniting of a colony which has come through in poor condition.

Where insufficient stores have been left on the colonies the fall before, the colonies should be fed at once more than they need for at least a week ahead, at the first examination. The writer prefers always any type of feeder which feeds above the cluster. Two parts sugar to one part water, by bulk, is an ideal spring feed. In uniting bees in spring it is advisable to unite directly, shaking bees alternately from frames taken from both hives to be united, before the hive where they are to remain. This allows placing the honey and brood all in one brood-chamber and obviates danger of chilling.

Watertown, Wis.

From a Polish Settlement in Manitoba

By H. W. Sanders

Up here in Manitoba, in spite of a severe climate, beekeeping is on the increase and some very successful apiaries are now being operated. There are many settlements of foreign-born immigrants and they have in some cases brought their knowledge of bees from Europe. At Beausejour, in the northern part of the province, is a settlement of Poles, and on one of the farms is a productive bee-yard, in which the enclosed photo was taken. It shows a colony in one of the home-made Polish hives in which a great many bees are kept in that locality. The hive is interesting historically, because it appears to be a "descendant" of the hive invented by Prokopovitch, in Russia, back in the 30's of last century. He seems to have been a man greatly in advance of his times and the principle of the movable comb was embodied in his hive. He conducted a school of beekeeping in addition to



Spring in the clover region of Virginia

the operation of a great number of colonies, and it may be through this school that his hive reached Poland.

The hive itself shows that the climate of Poland is very much like that of the colder regions of North America, for it is built with double walls and packing between. The frames stand on end in the hive and are gotten at by opening the little door, that can be seen at the side of the hive. To remove the ones at the far side it is necessary to take out each comb between. Originally the hive was not intended for use with a super, the idea being to extract from the outer combs, but the honey flows here are short and heavy and so the owner had bored holes in the top and placed an 8-frame Langstroth super above, which the bees were busy filling with honey. The entrance to the hive is through the round hole in the front. The large cover, which is here shown above the super, is intended only as a shade, as there was another flat cover over the frames in the super.

As will be seen by the rest of the picture, the Langstroth hive is supplanting these hives, here as elsewhere, being so much easier of operation.

The place where these Polish hives score is in wintering, for the tall space within resembles very closely the form of a hollow tree, and this is the natural wintering place for a colony of bees. The double walls with their packing hold the heat well.

The owner wintered his bees in a cellar and sometimes did not take them out till the first of May. Winter losses were small, and the bees soon built up in the spring from the abundance of natural pollen in the woods around. The large hives held plenty of honey.

He said that these hives were better for honey, but that the Langstroth were "better for swarms." This looks as if they were all managed on a let-alone plan, and naturally the shallow hives would be the ones to swarm, where the large, cool, deep, Polish hives would keep their forces together.

Manitoba.

Stretched Foundation and Sagging Combs

By A. C. Miller

What a merry time the boys are having trying to devise sundry and complex (and incidentally expensive) methods for wiring frames. Some of them are frankly resurrections of ancient ways, long since discarded. It is almost a crime, certainly not far from an unkindness, to throw a wrench in the machinery of their contriving. But unless a real beekeeper is inventing or trying to invent something he is not happy nor really in good standing with the fraternity; so the wrench should be withheld. However, in these days of high costs every saving is welcome and so perhaps I will be forgiven for spoiling some of the painfully devised schemes to prevent the evil of stretching.

Now listen, and pay strict attention to this very simple, almost absurdly simple system. Just **use heavier wire**, No. 26 or No. 28, the former is the better. Yes, I know it is rank heresy to advocate that which was long ago said to be too heavy, but the old "say so" never did appeal to me. Good Dr. Miller, you know, calls me an iconoclast, and I am rather proud of it when I can uproot a wasteful practice, be it ever so well fathered.

Do you hear that awful noise? It is the wail of the boys who have always been told that No. 30 wire is the only proper thing to use, and, dear things, they believe it, too, and he who assails their honored beliefs strikes them in a very sensitive, aye vital spot. I am sorry, boys, but it cannot be helped, for facts are facts.

The supply men will tell you they have no heavier wire in stock nor can they get it for you in time to use. Kindly thank them and run along to the nearest hardware store and buy plain annealed iron wire of the desired gauge and forget that it is not tinned. No, you do not have to have tinned wire, not when you use the heavier weight. Tinned wire has some advantages, but it is far from being essential.

You will probably have to buy the wire in coils, so be careful to put the coil on some sort of a reel, so that you can unwind it without snarling; the heavier wires are not so troublesome as the light, still you should take reasonable care. Then stretch the wire so that all tendency to curl and kink is taken out of it, cut into lengths suitable for a frame, and proceed to thread the frames. You won't die of shock, but you will be mightily surprised that you ever used the old plan of wiring direct from spools.

After the wire is in the frames,

make one end fast and take out all the slack before making the other end fast. Now you have a really good and suitable grid to which to fasten the foundation.

There are a few other items worth knowing—I know they are, because I know them. The first is, just entirely forget anything like a wedge for fastening the edges of the sheet of foundation. Yes, I know that is savoring of an unkindness to the mechanics who so long and laboriously and expensively to us, devised those wedges, those nice little appliances which so often do not get securely placed and fail to hold the important top edge of the foundation. Just drop the foundation into the groove and fasten it there with a little melted beeswax and rosin, three parts of the former and one of the latter. Paint it along with a **brush**, and forget anything like a wonderful wax tube, or spoon. With a brush you can securely fasten the sheet in place in half the time it takes to put a wedge in place, and when so stuck it stays for sure. The next thing to know is to use an electric imbedder, absolutely the only thing for a truly alive beekeeper to use. If you have electric lights on your place, cut the imbedder into the circuit, for it will work faster and better than with batteries and will not lay down just when you are in a hurry, as batteries sometimes do.

When you start to make the wax-rosin mixture, melt the two separately and strain the melted rosin into the wax, stirring until it is all in. This is to get rid of dirt and sediment which is usually in rosin, and to get a complete mixture of rosin and wax, for if it is not so mixed at the start the rosin is pretty sure to go to the bottom, and while the brush will get stuck on it, you won't.

Providence, R. I.



Polish bee hives.

Treating Combs for Moths

By C. C. Miller

Allow me to thank W. S. Pangburn for his article in the American Bee Journal, March, page 90. He seems to have gotten down fine the matter of treating wormy combs with carbon disulphide.

He is no doubt right in emphasizing the importance of "confining the gases as long as possible, and giving each set of combs the same strength dose." That the fumes of carbon disulphide are heavier than air is familiar, but that that makes it important to have each set of combs shut up separately is new to me, I confess. But it surely must make a safer thing to let each story have its own dose.

Where convenient it is well to have the treated combs inside a building. Outside, especially with open cracks in a strong wind, the fumes will not remain confined so long.

That failure of long confinement is probably the secret of most of the failures. And there is little excuse for it, seeing it is hardly conceivable that the combs will be needed for use again within a week; for it is hardly worth while to fumigate them if the

bees are to have them in that time.

In order to make tight the joints between the stories I like to use clay. Simply mix clay and water stiff enough so the clay will not run, and then, without any scraping, lay a roll of this dough upon the upper edge of the super (no need to scrape the edge), lay your paper over, put on another roll of dough and set on this the next super. You will have a close fit.

C. C. M.

Wiring Again

There have been shown different systems in the American Bee Journal about how to wire the frames. I use five horizontal wires and in the second place I use three brace wires. The advantage of this system is this, the brood-comb will be solid as a rock; it cannot sag; the queen can lay eggs clear up to the top bar and it cannot break down in the extractor. The disadvantages are: It takes more wire and time to fix it this way, and it cuts up the foundation more when the wires are imbedded than the old system does.

JOHN ARBTIN,

Des Moines Iowa.

BEEKEEPERS BY THE WAY



M. C. Richter, of California.

A Much-Traveled Beeman

The more a man sees of the way others do their work the better is he prepared to conduct his own business. On this basis M. C. Richter, of Modesto, Calif., should be well equipped. Not only is he familiar with California from one end to the other, but he has visited the beekeepers of many countries, including those of central Europe. In 1911 he became official entomologist to the Government of Chili at Santiago. He also established api-

aries of his own in that South American country where he found conditions somewhat similar to California, except that the seasons are reversed.

Richter is one of the best-known California beekeepers, having engaged in honey production in that State for a number of years. He is the author of an extensive bulletin on the honey plants of California, published by the State Agricultural College, and is prominent in the affairs of the Co-operative Beekeepers' Exchange.

Bees and Chickens

In the February number of the American Bee Journal, page 60, the question is asked if bees can be kept near chickens.

My chickens, young and old, have free access to my bee-yard and spend hours there each day, scratching and hunting for worms and bugs, dead larvæ, etc., especially those of drones which have been thrown out of the hives. My hives are set on boards laid flat on the ground, and they even scratch away narrow boards that I have lying in front for the bees to alight on, and I never yet have known a chicken to get stung. But they are a bit shy of bees buzzing around their heads, and if they get too annoying the chickens simply march out and return again when they feel like it.

On the same page, your reply to the question asked as to the difference between a ripe queen-cell and a fresh one, is not quite in harmony with my idea.

From my observation, a fresh or newly-sealed queen-cell looks somewhat like a peanut shell, except that the depressions are deeper and more prominent and less so toward and including the end, and remain thus until about 12 to 24 hours before the queen liberates herself. Then the bees remove the wax from the end in order to make it possible, or at least a more easy task, for the queen to thrust her sharp mandibles through the cocoon, as if done with a sharp knife. She cuts the cap from the end of the cell.

ELIAS FOX,
Union Center, Wis.

Queen Superseding by the Bees

By E. C. Schoemaker

WHILE my experience on queen superseding is of necessity limited by reason of the number of colonies I have, I am nevertheless absolutely certain of the data I gathered.

During June, 1918, I opened up colonies numbers 4 and 11 and found that superseding had taken place, unclipped queens being present in each. The queen in number 4 was already laying.

I did not look for the old queens at that time, as I held to the usual theory that only one queen would be tolerated under any condition. About one week later I again had occasion to examine number 11, when, very much to my surprise, I found the old queen. She seemed to be very slow in her movements and did not look at all vigorous. I immediately figured that she had disposed of the young queen that I had seen a week earlier, and had been injured in the combat.

I went on with my examination, and upon lifting out the next frame found my young queen, a perfect beauty, at work filling the cells with eggs. I immediately found the old queen and removed her, and in colony number 4 soon located old and young queens on adjoining frames.

My experience the past summer was even more convincing.

Colony number 8 superseded during late July or early in August. I removed the old queen from this hive on August 30 and at that time bees from the young queen were already emerging.

For two seasons I have been using the queen in colony number 10 as a breeding queen.

On August 15, upon examination of this colony, I found a virgin queen on the frames, so removed the old queen and put her in a three-frame nucleus to see how long she would live.

She laid in about one-half of one side of a Langstroth frame, about 2 or 3 per cent of brood in worker cells being capped convex, which I presume indicated that she was fast becoming sterile.

On August 25th this queen was removed and introduced to another three-frame nucleus, where she laid about one hundred eggs and apparently quit the job entirely.

In one of these nuclei the bees started cells while the queen was present. Each nucleus reared a queen which gave promise of being equal to any I have in my yard.

In all cases of supersedure mentioned in this article and several others where supersedure occurred but no data were kept, the writer noted a very marked effect on the surplus returns.

We usually have two flows sufficient to result in storage of surplus in this locality, the first from white clover, sweet clover, etc., and the second from heartsease, Spanish needle and fall flowers.

Colonies superseding in 1918 accomplished the switch of queens during the first flow, but stored no surplus until fall flow.

One of the two colonies superseding in 1919 stored about one-half of what I anticipated during the fall flow, while the other colony stored nothing at all during the same period. Both of these colonies did well on first flow, in fact, judged by returns on that flow, I expected colony number 8 to be my best one. In each of these cases supersedure took place between the two flows.

In all cases a comparison with other colonies revealed a very decided lack of sealed brood.

From this fact the writer concludes that supersedure is not ordinarily resorted to by the colony until the old queen very materially slackens her activities.

Two of four queens superseded in 1919 were introduced in 1918 as untested queens, having been secured from a prominent breeder.

These observations lead me to believe that if the apiarist can anticipate supersedure and replace queens before they show any decided falling off in productivity he will profit thereby to a much greater extent than the value of the time and attention required.

Muscataine, Iowa.

Granulated Honey

By A. F. Bonney

The time was when I did not enthrone over a campaign of national advertising of honey, but I have had a change of heart. All large bodies move slowly, and that is why my mind did not act at once, which, I think, will look logical to the average beekeeper, yclept honey producer.

An editorial on page 372 of the American Bee Journal was the lever which pried me loose from my false idols, and I am now very much in favor of advertising, as strongly and extensively as possible, to rid the mind of the honey-using public of the superstition that granulated honey is something to shy at; that it is, possibly, some mysterious mess which is intended to deceive and defraud.

I commenced this in my own field early in 1919, by calling attention strongly and especially that granulated honey was in every way just as good and pure as the liquid sort, and while I sold nearly 5,000 pounds—a big crop for an invalid, and an old one at that—I had but one complaint, and am not certain that that was on account of the honey being granulated. Receiving the complaint, I asked for a sample, promising to refund the price and pay all transportation charges if the complaint was just, but heard nothing more about it. I surmised that the honey was granulated, as that was the only thing which could be a cause of complaint.

Any advertisement about granulated honey that might do any good would be far too long for a sticker of any kind, but still we must have something which may be distributed liberally, and I wish to suggest that someone get out a proper ad which may be sold at a few cents per hundred to honey producers, and by them enclosed in each and every letter they write. In this way millions might ultimately be distributed in the world, with the usual result of intelligent advertising.

I do not think I am competent to get up such an ad for granulated honey, but I can at any rate give a suggestion, as follows:

HONEY

Liquid and Granulated

All honey on the market today is probably pure, on account of the pure food laws, but there seems to be an idea in the minds of some that honey that has become solid, or granulated, as honey producers say, is not just what it should be.

This idea is erroneous, for all pure honey will candy, or granulate, in time, and the colder the place it is kept the sooner the change will come.

This does not injure the honey at all, and if it is set in hot water for a time it will become liquid again, and the delicate flavor will not be lost, but it must not be boiled.

Many consumers of honey are now calling for the granulated sweet, and consume it in that form, and they also mix it half and half with butter, which not only saves butter, but

makes a delicious spread for bread and cakes.

EAT GRANULATED HONEY

The thoughtful honey producer will see that this may not only be sent out as above mentioned, but that one of the slips may be pasted on every shipment of honey. If this were done it would be but a short time before the demand for granulated honey would be firmly established.

Such a slip need not be more than $4\frac{1}{2} \times 2\frac{1}{2}$ inches in size, with a half-inch margin of white, and if printed by the millions need not cost more than a fraction of a cent each, possibly they might be sold for 50 or 75 cents a thousand. I will take 10,000 at \$1 the thousand to begin with.

There are advantages in granulated honey that must appeal to every beekeeper. We would be enabled to extract, run the honey into cans, let it granulate, and sell any time in the next ten years; we could use for shipping the paraffined paper containers; and, moreover, much handling of the crop would be avoided.

Iowa.

Book Reviews

"Outapiaries and their Management," the new book by M. G. Dant, being the first of its kind to appear, gives token that beekeeping is going more into the hands of specialists, and that outapiaries are on the increase.

Every year the number is larger of those whose colonies become too great in number to be kept profitably in one place, and when a man decides to establish a second apiary in a new place he is confronted with questions that have not before troubled him—questions that he would like to have answered by some one who has been through the mill. For such persons this book is designed, and meets the case nicely. The bee-lover will enjoy its clear instruction, and the book-lover will enjoy its clear typography.

The beekeeper of the present day may congratulate himself that as a new need arises a new book arises to meet the need.

C. C. MILLER.

Many a beekeeper whose printed information concerning honey plants has been limited to a few pages in some book upon beekeeping in general, has eagerly longed for something fuller on the subject. Now no less an authority than Frank C. Pellett has given us "American Honey Plants," a book of 300 large pages entirely devoted to the subject. To be sure, many of these pages are taken up with pictures of honey plants, but this makes the book all the more valuable. However familiar the reader may become with the reading matter, he will always come back to dwell fondly upon the illustrations, because of their real beauty.

C. C. MILLER.

The Children's Life of the Bee

Maurice Maeterlinck's book, "Life of the Bee," has recently been select-

ed and arranged by American authors and republished by Dodd, Mead & Company under the title "The Children's Life of the Bee." The book naturally retains all of the fine artistic writings of the original author and has been so arranged as to make it of interest to the child who is desirous of learning the history of the bee.

Even in its present form the book could hardly be called a primer in beekeeping, since much of the artistic value of Maeterlinck's original work would be lost if it were to be transformed into a child's book entirely.

The book, however, has sufficient value to be recommended. It is also illustrated with several excellent colored plates.

The price of the book is \$2, and it may be purchased of the publishers, Dodd, Mead & Company, of New York City, or from the American Bee Journal.

Wiring Frames

My method of wiring frames, while slow, and possibly not adapted to commercial honey production, will guarantee certainly maximum amount of worker comb with minimum stretching.

The frame is first wired in the regular way, and the sheet of foundation inserted, taking care to have the wires in the opposite side of the foundation from the V wedge. The wires are now imbedded in the foundation without inserting the V wedge.

Next, four wires, just as long as the frame is deep, are placed vertically in the frame equal distance apart, and fastened to the top bar, together with the foundation, by the V wedge. Then these four wires are imbedded in the foundation, making a perfect job, with wires running both ways and no sagging.

OSCAR McFARLAND,
Louisiana, Mo.

Bees Send Owner to College

Bees and honey are helping to pay the way of several students through the Minnesota College of Agriculture. Edmund M. Daggit, a junior, proprietor of Bonnie Oaks Apiaries, near Chippewa Falls, Wis., has 110 colonies of bees which were built up from 56 colonies last summer. In addition to the increase in bees he received, he says, about 4,500 pounds of honey, his net profits for the year 1919 from these two sources being between \$1,100 and \$1,200. He also sold 2,400 pounds of honey which he carried over from the year before.

The year 1914 is likely always to be a significant year in the chronology of Mr. Daggit. Early that year he bought his first colonies of bees. Then in the fall he started in the central School of Agriculture at University Farm, his bees by that time having increased to five colonies. So it will be seen that he got into business and into school about the same time.

"I took all of the bee courses," he says, "that I could get at University Farm under Professors Jager and

France. I increased my colonies to 15 in 1915 and sold \$50 worth of honey that year. In 1916 I had 39 colonies and \$150 worth of honey. I thought I was going strong in 1917 with 80 colonies and with \$350 worth of honey until winter came on and I lost many of the bees during the cold winter, but 1918 found me with 72 colonies and a honey flow which brought me \$800. A few of the colonies which I picked up to replace my losses were bought from my neighbors during the swarming season.

"I intend to increase to 800 colonies this year, in three yards. I produce extracted honey almost exclusively because more colonies can be managed and more conveniently under this system."

Bees and Spray Poison

Hearing reports of loss of bees from spraying in the Yakima Valley, I am wondering whether there is not some other cause. Before fruit trees blossomed last year I sold three colonies to Dufur Orchard Company, which owns 4,000 acres of bearing apple trees. They practice clean cultivation. There was no water within two miles from where the bees were placed in the middle of that big orchard. Lime-sulphur spray was being applied all around me when I placed the bees in the orchard. I put two empty supers on each hive and left two more for use if needed. When I went back in September the bees had the two supers filled with honey and were in fine condition, with hives full of brood. There was no apparent effect of spraying there.

Some complain of poison from the cover crop of alfalfa. Last summer I took care of M. A. Moody's bees, located in an orchard where alfalfa is raised as a cover crop and where the trees are sprayed with lime-sulphur and with arsenate of lead. In the fall I removed 600 pounds of honey from a few colonies. Some had filled five supers. There was no sign of poisoning.

I have an apiary of 100 colonies among the orchards and rented out 76 colonies in orchards where they are continually spraying. I have been keeping bees for thirty years and have not seen any bad effect from spraying. I would like to hear from other localities on this question of bees poisoned by spray.

Oregon. JOHN PASHEK.

Feeders and Feeding

I am only a beginner with 26 colonies, but the following experiment in feeding may be of interest to those of wider experience. I tried feeding in an old syrup evaporator, diluted honey placed where all the bees could get it. This resulted in the loss of a good many bees, so I tried another plan. Empty combs are used as containers and are filled by holding the top bar at an angle of about 45 degrees. The diluted honey is poured into the cells along the upper edge, gradually moving along until one side is filled, and then the comb is turned over. This can be done without

waste, as what runs off can be caught in the next one. When the comb is filled it is placed in the hive of the colony to be fed. It should be given when the bees are quiet, to avoid robbing. If anyone knows a simpler, cheaper or handier method, I would like to hear of it.

EZRA WIGGINS,
Jackson, Ala.

A Texas Association

The beekeepers of Matagorda and Wharton Counties, Texas, met on March 25, at Bay City, and, with the help of C. S. Rude, Assistant Entomologist, organized a local association of beekeepers. W. H. Moses is President, R. C. King Vice President, and J. D. Yancey Secretary. For information, write to W. H. Moses, Lane City, Texas.

Boys Want Apiary Positions

Prof. B. F. Kindig, of the Michigan Agricultural College, writes us that several graduates of the course in beekeeping at East Lansing are looking for positions either in inspection work or with commercial beekeepers. Those interested will do well to communicate with Professor Kindig.

Wants Black Bees

At the Kansas State Agricultural College a series of colored plates are being made showing the different races of bees. In order that the plates be true to life it is necessary to have pure stock from which to make the pictures. Just now Dr. J. H. Merrill is looking for specimens of the German, or black bee. Queens, drones and workers are wanted. While black bees are common in most localities, there are few places where they are to be found unmixed with other races. Anyone who can supply the pure black bees should write to Dr. Merrill at the college at Manhattan.

Another New York Meeting

Chemung Co., New York beekeepers met at Farm Bureau Hall on March 6, with President A. J. Tobey presiding. Loss of bees from spray poison, importance of ample stores for brood-rearing and the Ithaca short course were among the subjects discussed. Prices on supplies were quoted by various firms.

From Wisconsin

The beekeepers' Chautauqua held in Wisconsin last year was so successful that Professor Wilson announces a similar one again this year, to be held August 15 to 21, at Madison.

The beekeepers of that State have a department in "Wisconsin Horticulture," which is edited by Professor Wilson, bringing to them the latest news of Wisconsin beekeeping.

Plenty of Ventilation

Here is a story that I know to be true. A man by the name of Peterson kept quite a number of bees in box hives, probably 40 colonies. They were close to the house and were

very cross. In the winter, Mrs. Peterson took an ax with the idea of destroying a colony of the cross bees near the house. She split off one corner of the hive, about 2 inches wide each way. But the bees frightened her away. These bees wintered finely, in spite of the ventilation.

The farm papers ought to instruct their readers on when to spray the fruit trees. I think that is where I lose the largest number.

O. A. REES,
Pennsylvania.

Maryland State Association
The third night meeting of the
Maryland State Beekeepers' Associa-

tion of the winter series was held at the Hotel Rennert on the night of the 27th, with Mr. L. R. Watson as the principal speaker. His address was on the adaptation of practice to the behavior of the insect.

Following this paper an essay on "The best System of Spring Management to Secure Comb Honey and Prevent Swarming" was read by each of the following members, who were competing for a prize offered by the Association. Mr. George Harrison, Jr., was winner of the first prize, with Mr. T. G. Lytle recorded honorable mention. Approximately 50 members were present.

ERNEST N. CORY,
Secretary-Treasurer.

DR. MILLER'S ANSWERS

Answered by the Editor during the illness of Dr. Miller.

If an addressed stamped envelope is enclosed with the questions asked, a copy of the reply to be published will be mailed to the enquirer. Some questions require too lengthy answers to be available in this department. In such case the enquirer will be referred to the proper authorities or treatises. In many cases if the enquirer will read the questions of the previous numbers he will find exactly what he seeks.

Raising Queens

1. I would like to buy one or two Italian queens to raise my own queens, but as I have only blacks. I would like to know whether the queens raised would be purely mated? I would not want to buy queens for all my hives, as it would cost too much; so would like to buy a few only to use as breeding queens. How would it be to have those colonies with the Italian queens some distance from the others?

2. I have a supply of goldenrod honey and some don't care to buy it, and I don't know what to do with it. What do the people who have had tasting honey do with it?

LOUISIANA.

ANSWERS.—1. You would have to keep those bees at least 4 miles from the others and make sure that there were no other bees in the vicinity to insure their pure mating. Better take all the drone comb out of your black colonies and replace it with worker comb. Then put one good, big drone comb in the center of one of the Italian colonies, so as to raise plenty of Italian drones. You will probably still have some mismatings. But as the drones from your mismated queens will be pure Italian, owing to parthenogenesis, the next generation will be more likely to have pure matings. It is difficult at first to obtain pure bees when there are blacks all around. But we have all had to go through this difficulty, and yet there are many neighborhoods now where the Italians are in great majority.

2. I thought goldenrod honey was a very saleable article. You might blend it with some other grades, by heating both slightly. Or you may sell it to dealers in honey. Usually this honey is in good demand.

Moving Bees

I have purchased 3 hives of Italians. I don't know how to get them home, as they are just as busy now as they were last summer. They are carrying pollen all the time, and I can't imagine where they get it this time of the year. I only have to move them one mile, but do not know how to go about it, as it is not cold enough any day to confine them to the hive. Please let me know how to move them without leaving too many behind.

TEXAS.

ANSWER.—Make frames of 4 slats 1x2 inches,

which you will nail together so as to fit exactly over the top of one of your hives. Tack a sheet of wire cloth over each of these frames and nail them on top of the hive bodies, after having removed the cover and honey board, if there is one. You should have the wire cloth at the upper edge, so as to leave a space of an inch between the frames and the wire netting. Nail the bottom boards fast. Put the covers back on for the rest of the day.

The following evening, after the bees have ceased to fly, close the colonies by nailing a slat in front of the entrance. No screen there. Give air above, enough to keep them from smothering.

The next morning, get up before daylight and load your bees on a buggy, or a wagon or a truck, just as early as you can see to do it, and haul them to their destination. You should be able to get them there by sun up. Cover up the screens and release the bees at the entrance, using a smoker to frighten them thoroughly. Place a slanting board in front of the entrance, so they may see that their surroundings are changed as soon as they take flight. You will lose but few in this way. You may remove the screens at leisure.

If the weather is very cool they may be hauled at any time after being confined. We surmise that your colonies are strong and the weather warm.

Honey—Ventilation—Uniting

1. To keep extracted honey from granulating I understand one should heat it to 160 degrees or less before putting up and sealing? Is there any danger of a thermometer breaking when dipping into honey?

2. When you want ten frames of foundation filled out, should you put it above a strong colony, or below, to get it done quickest?

3. When sending off for a breeding queen and a pound of bees what date would be best to receive it?

4. If queen and bees are gotten from Tennessee, do the climatic conditions of Washington and Tennessee make any difference as to the working of the bees?

5. When supers are "staggered" one inch back first super, ahead on second, etc, for ventilation, should wire cloth be put over this

space. I should think the vent space would cause robbing.

6. When uniting a swarm of bees back to its colony I have read one can just dump the bees in front of the hive and let them go in. But isn't there any danger of them killing the queen in the old hive in spite of the fact that you discarded the queen from the swarm before uniting, or won't the virgin queen be emerged from the cell yet if I unite them the next day?

WASHINGTON.

ANSWERS.—1. The thermometer does not usually break, but to be entirely safe you might insert it in the honey when you begin heating. Better stir the honey from time to time.

2. The quickest way to have the foundation worked is to mix it among the combs of a strong colony. Usually they will work it if it is below the hive body.

3. This depends upon your honey crop. Better have them too early than too late, say a month before the crop begins.

4. As a rule, when bees are shipped from a country farther south, they are encouraged to work and have more activity.

5. Don't "stagger" the supers when there is the least danger of robbing. It is not necessary then. Neither should you do it unless the colony is very strong. It may be easily overdone.

6. There is very little danger of the queen being killed when you return the swarm to the same colony, unless you wait too long. Two days should be the limit.

Queen

1. How am I to determine whether the colony has a queen?

2. If the swarm seems weak, would you advise buying a pound or two of bees, or a new queen and bees?

3. What is meant by nuclei?

4. Can I buy a queen and a few pounds of bees and put them in a new hive with foundation, same as introducing a new swarm?

ILLINOIS.

ANSWERS.—1. From the outside, the only way to determine whether a colony has a queen is to watch whether the bees are carrying in pollen freely. If they are it is very probable the colony has a queen. If you open the hive and examine the combs, you should find brood in the combs. That is good evidence.

2. Buying bees by the pound does not seem advisable unless you buy a queen with them. Then it is best to build up a colony from those bees. If you buy bees without a queen, they will probably not do very well. Then many of them may be killed by introducing them to a queenright colony.

3. A nucleus, plural nuclei, is a diminutive colony. The word nucleus is from the Latin and means a pod, a core.

4. Yes, you can build a colony from a pound or two of bees and a queen. But you must be sure that they are well supplied with food, if there is no honey in the field.

Wintering—Settling a Swarm

1. How many pounds does one brood frame of honey weigh?

2. Will a colony of bees have enough honey for winter if the brood chamber is full of honey?

3. What should be done to settle down the bees on a branch of tree when a swarm issues in air?

NEBRASKA.

ANSWERS.—1. That depends on the thickness of it and on how full it is. When exceedingly well filled and thick, it may weigh 8 pounds. It may be as light as 5 pounds.

2. It certainly does not need to be full of honey from top to bottom to have enough. You rarely have brood frames entirely filled with honey.

3. A very good way is to fasten a dry comb to a pole and place it in reach of the swarm. But in some cases, no matter what you do, they will settle where you least expect them to.

Deep Brood-nest Vs. Shallow Supers

Do you think it would be advisable to change from the regular deep brood-nest (L. size), to the divisible brood-nest (shallow supers)? I am bothered in getting bees to go up into the supers when I have no bait combs to put in them, and I think a deep super is too much to give them at one time. If I take a comb from the deep brood-nest and put it in the shallow supers they build a comb on the bottom of it and fill it with honey and brood, and I can't return it to the brood-nest without destroying this comb.

TEXAS.

ANSWER.—Your inquiry reads as if you took a comb from the brood-nest and placed it in the upper story without placing another frame in the lower story. Of course the bees will build down under it, to fill the space in the brood-nest. You should replace that frame with another containing comb foundation, or at least starters.

Very few people like the shallow brood-nest, the average Langstroth hive being shallow enough. Yet, a very extensive beekeeper of Texas, Mr. Louis Scholl, uses these shallow stories. We prefer a deep brood-nest and a shallow super. But in any case, it is well to have either combs or foundation to use in your upper stories.

Wire in Foundation

I have been very much interested in the different systems of wiring given in the February number of the American Bee Journal and Gleanings. I bought some frames once that were wired from corner to corner with one wire lengthwise, close to the top, but they were the most miserable things I ever had anything to do with. The foundation would buckle in the center above where the wires cross, as there is very little give to tight wires stretched in that way. I want to get rid of that by bringing the cross wires closer to the top. I have been thinking that it would be practical to make foundation with fine wires put in vertically, say 1 or 2 inches apart, fine enough so they could be rolled right in as the foundation is made; perhaps fine copper wire would be best. This would help to keep the foundation from stretching. With foundation with these wires in, it would be only necessary for the beekeeper to wire his frames horizontally.

COLORADO.

ANSWER.—Your suggestion of wires put in vertically was put in practice by the Van Deusen people in their flat-bottom foundation for a long time. The proof that this was not very practical is in the fact that after selling it for years the Van Deusen people have stopped manufacturing.

Queen Regulating Sex

When I see thousands of worker bees emerging from a frame and not a single drone amongst them, and again see hundreds of drones hatching from a space evidently allotted to them, with no workers, and I know that one queen lays the eggs in each batch, I wonder how does she regulate the laying to keep the sexes separate. Can you tell me?

ONTARIO.

ANSWER.—It has been advanced that the shape of the cell has something to do with the fertilizing of the egg, as it is laid; since we know that the eggs that hatch as drones are unfertilized, and only the eggs that hatch as females (workers or queens) are fertilized as they pass by the spermatheca. But a queen sometimes lays eggs in queen cells. Then how does she know that these eggs must be fertilized to bring the right sex? I will have to return the question to you, for I don't know.

Bees Carrying Out Brood

I have one stand of bees that is acting very peculiar; they are carrying out worker brood that is still in the grub state, but perfect; they have about 35 or 40 pounds of honey and it is not because they are starving, but they are weak. The most of them froze out this winter. The cause was water or frost got into the brood-nest, but not any more than the rest, and I don't understand the reason. My ques-

tion is, why do bees carry out brood in February when they have plenty of stores?

INDIANA.

ANSWER.—I would judge that the queen is very prolific and laid eggs to the edge of the cluster in mild days. Then this brood got chilled when a cold night came.

Miscellaneous

1. How many revolutions in a minute does the cage of an extractor have to run to extract the honey from comb when all things are normal?

2. Does the law compel bees shipped from Michigan to Wisconsin to be inspected?

3. Will you give me full details of the construction of your new 2-inch space bottom-board?

4. Would it hinder my bees to go one-half mile to a basswood grove, or should I place them in the grove?

WISCONSIN.

ANSWERS.—1. One hundred and fifty revolutions are sufficient when the honey is not cold or too thick. But extractors usually revolve at greater speed. In many cases they revolve faster than necessary.

2. We are not quite sure of the law in this respect. Write to S. B. Fracker, State Entomologist, Madison, Wis., for positive information.

3. The bottom-board is made of 6 pieces of $\frac{7}{8}$ -inch stuff; 2 pieces $22\frac{1}{2} \times 2$, one piece $12\frac{1}{2} \times 2$, and 3 pieces $7\frac{1}{2} \times 13\frac{3}{4}$. The 2-inch pieces are for sides and back end, the others form the bottom. It makes a box 2 inches deep, open at one end. A bottom rack is used in the summer to prevent the bees from building down; it is taken away for wintering. This is made of 2 pieces $18 \times 1\frac{1}{4}$, and 21 pieces $10\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$. The latter are nailed, ladder-fashion, $\frac{1}{2}$ inch apart on the $\frac{3}{4}$ -inch sides of the two large pieces and are allowed to project at the ends about an inch. This bottom-board is for an 8-frame hive. Change the sizes to fit a larger one.

4. That distance is just about right. They would go several miles to the basswood, but it is better inside of a mile.

Transferring

I have been trying for some months to purchase bees near home, and all I have been able to get is four swarms in nail kegs. I have never handled bees, only to help have a couple of swarms. Please tell me how to transfer these bees into modern hives without losing them.

WASHINGTON.

ANSWER.—The proper time to transfer bees is during fruit bloom, or at any time when they are harvesting honey and the hive is still light in weight.

Drive the bees from the box, or gum, or keg, into any kind of a box by drumming them. Set the box containing the bees on the stand. Take the hive containing the combs into a house and cut the combs containing brood and fasten them in frames. To fasten them in, we use wires of the width or height of the frames, bent at the end about half an inch, so as to drive the bent end into the edge of the frame. Put those combs in a hive, and enough dry combs or comb foundation to fill it and shake the swarm in front of it, on the old stand. In a week you can remove the wires, as the bees will have fastened the combs in place.

Feeding

I bought a barrel of New Orleans brown sugar to feed my bees this April and May. Do you think it will make good feed, and would two parts water to one of sugar be all right for spring feeding? The sugar is rather strong tasting.

MISSOURI.

ANSWER.—The brown sugar will probably do for spring feed, though I doubt whether there is any advantage in it in the cheapness over

the white granulated sugar. It would probably not be healthy for winter.

Two parts water for one of sugar will dilute it too much. For winter we use two parts sugar for one of water. The spring feed may be diluted much more than the winter feed, but one part of sugar or one and a half parts to one of water will be plenty liquid enough. Warm it up before giving it to them. It will be better.

Some beekeepers in Northern Michigan dilute sugar very thin and feed it to their bees outside. This will do where there are no bees belonging to other people in the neighborhood. When sugar is very much diluted, it may be fed outside without causing any other excitement than a light honey crop would do.

Requeen—Full Sheets

1. I have two colonies of bees, A and B. Colony A has proved to be the strongest and best honey gatherers. Now I want to requeen colony B with a queen or queen-cell from A. Will you please tell me how to do this?

2. I read in the American Bee Journal that full sheets of foundation should never be given to a new swarm. How, then, shall a new swarm be given full sheets of foundation?

NEBRASKA.

ANSWERS.—1. Kill the queen of B, take all its brood away and give it one or two, or perhaps three combs of brood from A. Make sure that there is plenty of very young brood, larvae not over 3 days old. B will then rear a queen from this brood. The number of combs of brood to be given B is according to its strength. You must be sure that they have more than enough bees to cover the brood well, and plenty of honey. In a time of dearth it is well to feed the colony that is rearing queens. This must not be done until you are sure there are drones to fertilize the young queen. If it is done when the colonies are strong, it will be well to inspect your queen-rearing colony in the morning of the tenth day after making it queenless and destroy or take away all but one queen-cell, unless you want them to swarm, which is not desirable under those circumstances.

2. The statement made by M. G. Dadant was not sufficiently explicit. It will not do in hot weather, to give all foundation in full sheets to a swarm, as the weight of bees is likely to break down some of it. But if you give them two or three partly built combs they will cluster on those mainly, and the balance may be full sheets of foundation. If you have no built combs on hand, you may take one or more from the colony that swarmed, exchanging them for full sheets of foundation.

Wintering—Protecting Neighbors

1. I have five colonies of bees and winter them outside. One of these is very uneasy. They come out on cold days and fly when no sun is shining. Many fall on the snow and die. I darkened the entrance, but that did not stop them.

2. I live in town and have close neighbors. Sometimes my bees bother them. Do you think it would help any to plant grapes around my bees. A board fence would make it rather warm in summer and does not look good in town.

IOWA.

ANSWERS.—1. They may be suffering from bad honey that clogs their intestines unduly. In that case you must see more or less of their discharges around the entrance. When they are in very bad shape they discharge their feces upon one another and the colony soon dies. On the other hand, the colony may be strong enough that the least disturbance causes them to fly, especially if the weather is not very cold. In that case they will carry dead bees out trying to clean their bottom-board when they ought to be quiet. In the first case they will

probably die out before warm weather. In the second case the colony must be very strong. It is impossible to say which is the case, on the description you give.

2. Yes, planting grape vines is a very good thing. But in the mean time you will have more or less trouble with the neighbors, who can hardly be blamed for feeling irritated if the bees are cross. We suggest erecting a screen fence between the apiary and the neighbor's lot. I have seen in Peoria an apiary close to a neighbor's back door, screened with 1-inch mesh chicken netting to the height of about 10 feet. The bees do not like to fly through this netting and so take a different direction for their flight. That makes all the difference. Try it and let us know how it works. It may not work in all cases alike. Don't fail to plant your grape vines anyhow.

Two Queens in One Hive—Introducing—Shipping

1. Can you have two queens in a two-story brood chamber during the honey season by the aid of an excluder between the two stories? I should think a laying queen above and a laying queen below would build colonies very strong and gather a good surplus.

2. For increasing two hives from one (three in all) by aid of nuclei and introducing queens, what do you think of the following: Put two queens in cages on or between frames of hive to make the two nuclei from, and leave them there with plenty of honey to eat for three days so that they will acquire hive odor. Then take six frames of adhering bees and put in two different hives, introducing one of these caged queens to each three frames, by taking cork out of one end and putting in a little plug of foundation, and placing amongst the three frames?

3. If you shipped about ten colonies from, say Washington to Oregon, Idaho or Montana, what would be the best and cheapest way of shipping them?

4. Will a pound of bees and a queen re-

ceived in March make any surplus before end of the season?

5. What is one of the safest ways of introducing a queen to two-frame nucleus made by dividing?

6. Could one have a two-story brood chamber and give the queen more room by raising the brood from the first story as she lays it, to the second, replacing first story with empty combs? WASHINGTON.

ANSWERS.—1. Yes, but in practice you may find it unprofitable. Try it.

2. It will work all right. A chunk of honey will be still better than a piece of foundation as stopper of the cages.

3. Freight would be the cheapest. But it is doubtful if this mode is advisable on less than carload lots. Railroad companies charge enormous rates anyhow. Probably it will be best to ship by express.

4. That depends on so many circumstances that it would be impossible to reply knowingly. Some people have succeeded in getting a very fair crop from bees by the pound. But it would probably be best to get two-pound lots.

5. Introducing queens by the method recommended by all shippers is the safest, unless you introduce the queen to bees that are just hatching. Keep the queen caged in the hive 48 hours, then release her by letting the bees eat to her through the candy or by replacing the stopper of the cage with a little honey capings.

6. Yes, that is a very good way, if you do not mind the work.

Swarming—Young Bees Dead

1. I have a colony that I've had on hand for 15 years. They are always in first-class condition, and if any honey is gathered I can always "bank" on that colony having a good portion of it. During that time they have never swarmed or prepared for swarming. I have transferred them two or three times in order to give them new comb and hive. Why haven't they swarmed?

2. During the last two weeks of August most all of my colonies were carrying out young bees, larvae a week old to winged insects just ready to come out for work. I don't think it's because they were dead, for the winged ones were alive, some being old enough to crawl about for awhile.

3. Along the middle of June I had a very nice swarm come out and settle on a cedar tree. After they were nearly all settled I prepared to hive them, but noticed they were all at work like a bunch of worms, and seemed to be very dissatisfied, so I sprayed them with water to quiet them, which did the trick O. K. Then I put them into a hive and they began killing each other, and by night there was nearly a quart measure full of dead bees in front of the hive. The bees in the parent hive did the same thing, and by night the ground in front of their hive was covered with dead bees. This swarm came out about 4 o'clock p. m. They went to work next day and have the hive about filled with honey. Why the killing?

4. I had two good swarms to issue from one hive this season. Later I noticed the parent hive wasn't working, so I opened it and found it vacant; no bees there, yet there was some honey and brood, and bee eggs and capped brood, all alive save some few of the younger larvae. Now that "gets my goat," but maybe you can enlighten me. MISSOURI.

ANSWERS.—1. It may be that size of hive, amount of shade and other circumstances, combined to make the bees satisfied without swarming. But I suspect there's something in the blood of those bees that makes them approach non-swarmer. If I were you I'd be thankful to have them and would breed from them.

2. Quite possibly they were casting out drones at the annual slaughter of drones.

3. Possibly another swarm attempted to unite with them. Swarms generally unite peaceably, but sometimes not, especially if one does not have a normal queen.

4. It is possible that after the issuing of the swarms the parent colony failed to have a laying queen; either having a drone-layer or no queen at all, but developing laying workers.

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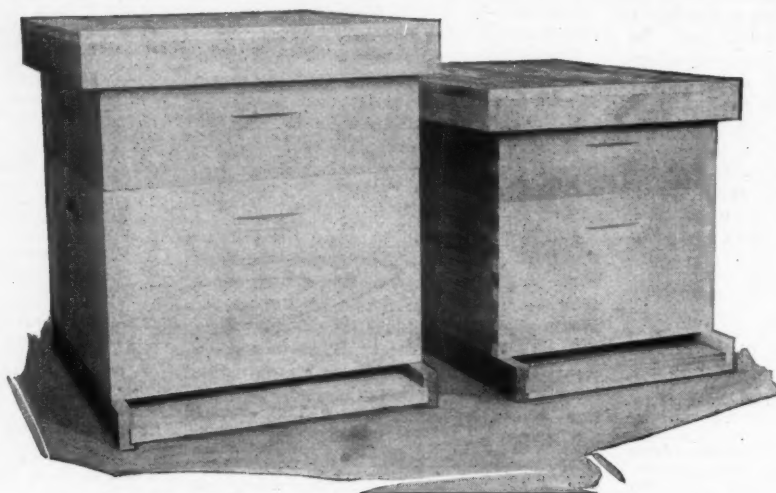
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The Modified Dadant Hive has 40 per cent larger Brood Comb Area than the Ten-Frame Langstroth Hive

A glance at this illustration shows you why the Modified Dadant Hive should be in your apiary. See the large size compared with the ten-frame "Standard." Features embodied in this hive are: 1, a deep frame; 2, a large brood chamber in one story; 3, ample ventilation by wide frame spacing; 4, excellence in wintering; 5, swarming easily controlled

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Fertilizing Drone Eggs

If anyone should be repeating my experiments in drone egg fertilization (see American Bee Journal, December, 1919, p. 415), I will add that unless operations are carried out at a high temperature, the result will be failure, seeing that natural fertilization occurs at the internal heat of the queen's body. Also, in my latest investigations the drone has been squeezed onto a warm glass plate, previous experiments showing that the extraneous matter of the drone often prevented the sperm finding its way through the micropylar aperture of the egg. The squeezing of the drone requires some practice before the spermatophore is ejected. It is applied to the large end of the egg with a fine hair pencil.

Regarding your interesting articles in the February American Bee Journal, on foundation stretching and wiring, trouble is often experienced in getting the wires taut, without cutting into the soft wood side bars. A useful preventative is to have small tin discs. These are threaded onto the wire, when wiring up the frame, and then pressed into the wood. These handy helps are cheaply punched out by the thousand.

GILBERT BARRATT.

Honey Plants of Love County Oklahoma

First we have the elm and black-haw trees, which furnish both honey and pollen for early brood-rearing. These trees bloom in February and March. The fruit trees bloom from the 15th of March to the 1st of April. The blackberry and wild dewberry follow the fruit trees. Then we have the persimmon trees, which furnish honey. For surplus honey horse-mint, which blooms from May 1 until June 30, yields amber honey of excellent flavor and heavy body. The cotton plant, hundreds of acres of which is grown in this county, furnishes water-white honey, of superior flavor and extra heavy body. This flow lasts from July 20 until September 30. We have a flow from sunflowers. This flow comes between the horse-mint and cotton bloom flow and lasts until October 1. This honey is amber, and not of very good flavor.

We have a fall flow from broom weeds, which give us an abundance of winter stores. This honey is not salable, but is good for winter stores. We do not have to feed in the fall unless it is a dry year.

EUGENE HOLLOWAY.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted for five cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEEES AND QUEENS

See Atwater's classified honey adv't.

QUEENS BY RETURN MAIL—Tested Italian queens, \$2.50 each. Untested queens, ready May 1, \$1.25, \$13.50 per doz. No disease and all queens guaranteed to be the best.
J. W. K. Shaw, Loreauville, La.

FOR SALE—Hardy Italian queens, \$1 each
W. G. Lauver, Middletown, Pa.

FOR SALE—My famous three-banded Italian queens, \$1.25 each, six for \$7, from June 1 to November. J. W. Romberger, Apiarist, 8113 Locust St., St. Joseph, Mo.

WANTED—To hear from beekeepers wanting queens from three-banded Italian stock which for the last 10 years made the largest average per colony of any bees in Indiana. All orders accepted to be filled after May 20. Untested queens, May and June, \$2 each, 6 for \$10.50.
Charles Kennard, Knightstown, Ind.

THE ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, \$1.50 each; six for \$8. Tested, \$2 each. Select tested, \$2.50 each. Virgins \$1. Nuclei for sale
Prof. W. A. Matheny, Ohio University, Athens, Ohio.

DAY-OLD QUEENS at practical prices. Superior improved Italian stock. Mailed in safety introducing cages. Safe arrival guaranteed to any part of the U. S. and Canada. Send for circular. Prices: 1, 75c; 10, \$6; 100, \$60.
James McKee, Riverside, Calif.

QUEENS—Italian queens of excellent stock will be ready to mail June 1. Untested, \$1.50 each; 6, \$7.50; 12, \$14.
J. D. Harrah, R. No. 1, Freewater, Ore.

FOR SALE—Hardy northern bred Italian queens, untested, \$1.50 each; tested, \$2.50 each. Bees, 1-lb., \$2.50. Write for quantity prices. Early delivery.
Clifton Smith, Salesville, Ohio.

FOR SALE—Hardy northern bred Italian queens, untested, \$2 each, 6 for \$11, May 15 to July 15. Select tested, \$3, after June 1.
Dr. C. E. Sheldon, Coeur D'Alene, Idaho.

FOR SALE—80 colonies bees in 10-frame 1-story hives, spaced 9 frames per hive. Will ship about June 1, when unpacked from their winter cages.
F. J. Rettig, Wabash, Ind.

BOOKING ORDERS for June delivery. Pure 3-banded Italian queens, reared by the Doolittle method. Untested, each \$1, 6 for \$5.75; per dozen, \$11. Tested, each, \$2; six for \$11; per dozen, \$20.
H. N. Boley, Hillsboro, Ia.

FOR SALE—Bees; good hybrid stock from outyards in 2-lb. packages, with a tested queen from home yard, for \$7; or with untested queen, \$6. Two-frame nucleus Italian bees, \$5; 3-frame nucleus, \$6.75.
C. H. Cobb, Belleville, Ark.

FOR SALE—Italian queens that will give results; untested, \$2; tested, \$3; breeders, \$10.
A. Beyer, Krotz Springs, La.

TRYING IS KNOWING—I can tell you a lot of facts about Victor's Italian queens. I can tell you that they have all the good qualities that queen breeders ever claimed for their queens. But what of that? You can't know until you try it for yourself. Mated, \$1.25 each; six, \$7; twelve, \$13.50, from June 1 to October 1. Julius Victor, Martinsville, N. Y.

FOR SALE—Bees in Hoffman 10-frame hives.
Julius Gentz, Wabeno, Wis.

FOR SALE—2-8 and 8-10 frame hives of bees on full-sheet combs; all wired; no foulbrood. Leather Italians, \$12 and \$15.
F. W. Hemmings, Thomaston, Conn.

FOR SALE—Italian queens. Prices for untested, in June, \$1.50 each, \$8.25 for six, \$16 for twelve; tested, \$2.50 each from July 1 to October 1; untested, \$1.25 each, \$7 for six, \$13.50 for twelve; tested, \$2 each; Virgins, 75c each. Mismatched queens will be replaced if returned in 30 days. Dead queens will be replaced if returned to me by return mail.
R. B. Grout, Jamaica, Vt.

FOR SALE—Italian queens at reduced prices for June and balance of summer.
Irish Brothers, Doctortown, Ga.

FOR SALE—Pure Italian queens. Select untested, 1, \$1.50; 6, \$7.50; 12, \$13.50; 50, \$55; 100 and over, each \$1. Also packages and nuclei.
Golden Star Apiaries, San Jose, Cal.

FOR SALE—I. F. Miller's strain Italian queen bees. Northern bred for business from my best superior breeders; gentle, roll honey in, hardy, winter well, not inclined to swarm, 3-banded. Queens a specialty; 26 years breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada. Untested, \$1.40; 3, \$3.75; 6, \$7; 12, \$13. select untested, \$1.65; 3, \$4.50; 6, \$8.50; 12, \$16.
I. F. Miller, Brookville, Pa., R. 2.

FOR SALE—Three-banded Italian queens, June 1 to October 1, untested \$1.50, tested \$2.50, select tested \$3.50.
Wm. C. Young, Box 249, Des Plaines, Ill.

FOR SALE—Queens, nuclei, packages, colonies from our apiaries in Arkansas and Louisiana. Write for prices now.
The Foster Honey & Mercantile Co., Boulder, Colo.

FOR SALE—Three-banded Italian queens, ready June 10. Untested only, 1, \$1.50; 6, \$8; doz., \$15. Book orders now.
Ross B. Scott, Rt. No. 4, La Grange, Ind.

FOR SALE—200 2-frame nuclei ready for delivery from May 1 to 20, at \$5.50 each, with young untested queen. Where tested queens are wanted, \$6.50 each.
Cotton Belt Apiaries, Roxton, Texas.

FOR SALE—Superior California Queens—Western beekeepers may now secure our famous Italian queens at the following prices: One untested, \$1.25; fifty untested, \$57.50; one hundred untested, \$100. Orders filled in rotation; first deliveries March 1, 1920.
Edson Apiaries, Gridley, Calif.

FOR SALE—Leather colored Italian queens, tested, until June 1, \$2.50; after, \$2; untested, \$1.25; \$13 per dozen. Root's goods, Root's prices.
A. W. Yates, 15 Chapman St., Hartford, Conn.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price \$1.25 each; 12 or more, \$1 each.
J. H. Haughey, Berrien Springs, Mich.

FOR SALE—Choice Iowa bred 3-banded untested Italian queens, after June 15, \$1.75; July, \$1.50; August and September, \$1.35 each.
J. R. Coon, Ames, Iowa.

FOR SALE—3-banded Italian queens from best honey-gathering strain obtainable; (no disease). Untested queens, \$1.25 each; 6, \$6.50; 12, \$12. Select untested, \$1.50 each; 6, \$9; 12, \$18. Tested, \$2.50 each. Safe arrival and satisfaction guaranteed. Your orders filled promptly.
W. T. Perdue & Sons, R. No. 1, Fort Deposit, Ala.

FOR SALE—Highest grade 3-banded Italian queens, ready June 1. Queen and drone mothers are selected from stock of proven worth in hardiness, gentleness, honey production and disease-resisting qualities. Untested, each, \$1.25; 6, \$6.50; 12, \$12; 50, \$47.50; 100, \$90. Your correspondence will receive prompt attention, and I guarantee satisfaction.
A. E. Crandall, Berlin, Conn.

BOOK YOUR ORDERS for QUEENS now—Goldens, \$2; tested, \$3; banded, \$1.50; tested, \$2.50; six or more 10 per cent less.
Clover Leaf Apiaries, Wahoo, Neb.

"QUALITY" THREE-BANDED ITALIANS from excellent stock; untested queens, 1, \$1.50; 6 for \$7.50; 12 for \$13.50; 50 for \$55; 100 for \$100.
N. J. James, 1185 Bird Ave., San Jose, Calif.

MOTT'S Northern Bred Italian Queens—I have breeding mothers place in the south for April and early May queens. Plans "How to Introduce Queen and Increase," 25c. If you want beauty with the best of summer and winter laying birds, try a setting of my Golden Campines.

E. E. Mott, Glenwood, Mich.

FOR SALE—2,000 pounds of bees in pound packages, early.
H. E. Graham, Gause, Texas.

FOR SALE—A. I. Root strain of resisting and honey-gathering, leather-colored Italian queens. Untested queens, \$1.50 each, 25 or more \$1.40. Tested, \$2.50 each, 25 or more, \$2.25. Select tested, \$3. For larger amounts write. A. J. Pinard, Morgan Hill, Calif.

1920 PRICES on nuclei and queens, Miller strain. Queens, untested, \$1.50 each, \$15 per doz.; tested, \$2.00 each, \$22 per doz. One-frame nuclei, \$3; two-frame, \$5; three-frame \$6.50, without queens, f. o. b. Mason, Miss. Five per cent discount in lots of 25 or more. We have never had any bee or brood disease here. Will have no queens except with nuclei, until June 1. Safe arrival and satisfaction guaranteed. Geo. A. Hummer & Sons Prairie Point, Miss.

1920 PRICES for "She Suits Me" queens. Untested Italian queen, from May 15 to June 15, \$1.50 each. After June 15, \$1.30 each; \$12.50 for ten; \$1.10 each for 25 or more.

Allen Latham, Norwichtown, Conn.

FOR SALE—After April 15, our golden Italian queens, untested, one \$1.50 or \$15 per doz.; select untested, one, \$1.75 or \$18 per doz.; tested, \$3 each. Safe arrival guaranteed. Tillery Bros., R. 5, Georgiana, Ala.

FOR SALE—Goldens that are true to name. Select untested, one, \$1.50; six, \$7.50; 12, \$12.50; 50, \$55; 100, \$100. Garden City Apiaries, San Jose, Calif.

FOR SALE—Golden and three-band queens. Untested, April, May and June delivery, \$1.25 each; \$12.50 per doz. Satisfaction. R. O. Cox, Rt. 4, Greenville, Ala.

BEEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

BEEES AND QUEENS from my New Jersey apiary. J. H. M. Cook, 1Atf 84 Cortland St., New York City.

HONEY AND BEESWAX

See Atwater's classified honey adv't.

FOR SALE—We have a limited amount of our crop white clover, extracted basswood honey, all packed in new 60-lb. cans, 2 to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co., Newark, N. Y.

WANTED—White clover or light extracted honey. Send sample; state how honey is put up and lowest cash price delivered at Monroe; also buy beeswax. E. B. Rosa, Monroe, Wis.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

FOR SALE—24 cases buckwheat comb honey, No. 1 quality, \$6 per case; 12 cases mixed, not all capped, \$4 per case, 6 cases to carrier; clear clover extracted, 25c per pound; buckwheat and clover mixed, 20c, 2 60-pound cans to case. H. G. Quirin, Bellevue, O.

HONEY, SUPPLY YOUR CUSTOMERS—Case of two 60-lb. cans finest alfalfa-clover honey, extra strong cases, \$24, 5 or more cases at \$21.00, all f. o. b. here. E. F. Atwater, Former Special Field Agent in Beekeeping, U. S. Dept. Agr., Meridian, Idaho.

WANTED—Comb and extracted honey. The L. H. Snider Apiaries, Auburn, Ind.

FOR SALE

See Atwater's classified honey adv't.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog. A. E. Burdick, Sunnyside, Wash.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled. Superior Honey Co., Ogden, Utah.

FOR SALE—About 50 colonies of bees, mostly Italians; also complete hives, supers, comb and extracted, and other used equipment. Bees and supplies are located near Lansing, Mich. Duplicate volumes A. B. J. and Gleanings also for sale or exchange. F. Eric Millen, O. A. C., Guelph, Ontario, Canada.

FOR SALE—Pure bred New Zealand rabbits and other kinds. Iowa Rabbit Farm, 612 N. Cherry St., Creston, Ia.

FOR SALE—Orchard Hill Farm; fine for apary, fruit, asparagus. Shore and city markets. R. F. D. 1, Freehold, N. J.

FOR SALE—New Cowan rapid reversible extractor, \$30. Lorenzo Clark, Winona, Minn.

FOR SALE—Bee supply business, including equipped mill for the manufacture of bee hives; also a small warehouse and 80-colony apiary. This is a splendid opportunity for the right party. The business is well established and profitable, but owing to reasons which will be fully explained, I desire to retire. Don't answer this add unless you mean business and have or can command a few thousand dollars. Address, A. E. Burdick, Sunnyside, Wash.

WANTED

See Atwater's classified honey adv't.

WANTED—Beeswax The L. D. Caulk Co., Milford, Delaware.

WANTED—Beeswax. At present we pay 40 cents per pound in cash and 42 cents in trade for clean, yellow wax, delivered Denver. The Colorado Honey Producers' Association, Denver, Colo.

WANTED—Honey—50,000 lbs. bulk comb and extracted 1920 crop, produced and packed according to my instructions and specifications in containers furnished by me. Write today for instructions and contract blank. W. A. Hunter, Terre Haute, Ind.

WANTED—Your old combs, cappings and slumgum to render into beeswax. We get enough more wax with our well equipped presses to pay for our work. Dadant & Sons, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices. Superior Honey Co., Ogden, Utah.

WANTED—Undamaged copies of February, 1920 American Bee Journal. Will pay 10c a piece. When mailing wrap so the entire copy is covered. American Bee Journal, Hamilton, Ill.

WANTED—Extracted honey in white and amber grades. State lowest price; how packed. Send sample. Harmony Bee & Honey Co., White Bear Lake, Minn.

SITUATIONS

See Atwater's classified honey adv't.

WANTED—Position in apiary; 3 years experience; age 18. Note wages and description of apiary. Winslow Shearman, Jamestown, N. Y., Route 77.

WANTED—What have you to offer young man, 24 years old, having had one summer in apiary of 800, run for extracted. Can handle cars. Address L. D. Blair, 240 Euclid Ave., Ridgeway, Elk Co., Pa.

WANTED—Man to help with bees. State age, experience and wages wanted in first letter. Board furnished. Mathilde Candler, Cassville, Wis.

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write, giving age, height, weight, experience, reference and wages wanted. W. A. Latschaw Co., Clarion, Mich.

WANTED—Will need more help. Refer to my advertisement February and March; 1,000 colonies. Write fully. E. F. Atwater, Meridian Idaho. Former Special Field Agent in Beekeeping, U. S. Department Agriculture, California, Arizona and New Mexico.

WANTED—Experienced man for comb honey. Give age, experience and salary expected. B. F. Smith, Jr., Fromberg, Mont.

WANTED—Man for season of 1920 to work with bees. State age, experience and wages. We furnish board. Opportunity for permanent situation to right man. Also want man to work in shop, put up honey and do general shop work and make deliveries. The Rocky Mountain Bee Co., Box 1319, Billings, Mont.

WANTED—One or two good queen-rearing men to begin work February 15, 1920. Nueces County Apiaries, Calallen, Texas.

SUPPLIES

See Atwater's classified honey adv't.

FOR SALE—At right prices, Root, Jumbo 10-frame, dovetailed hive bodies, 16½ in. wide, with metal-spaced frames. Everything nailed and painted 3 coats of white. Work done by expert mechanics. 'This lot of 300 bodies has never been out of our warehouse. Dadant medium brood foundation for Jumbo frames, but offered only when brood-chambers are ordered. We can make verified statement, naming several apiary inspectors, that no disease has ever been found in our yards or in this section. Send for complete price list and prices. We also offer all kinds of Root 8 and 10-frame supplies slightly used. Orders carefully packed and prompt shipments made. Here are the best of supplies ready to go into the apiaries at money-saving prices. The Hoffman Apiaries, Janelville, Minn.

FOR SALE—We make Cypress hives, frames, supers, feeders. Write us for prices. Honey barrels for sale. Sarasota Bee Co., Sarasota, Fla.

FOR SALE CHEAP—Bee hives and supers, good as new, nailed and painted. Henry Feder, Jr., West Allis, Wis., R. 5, Box 173, 68th Ave.

FOR SALE—500 good second hand 60-lb. cans, two to the case, 80c per case. H. Rohrs, Hinsdale, Ill.

FOR SALE—10-frame dovetailed hives in lots of one to fifty, very cheap. Wm. Craig, Aitkin, Minn.

SPECIAL PRICE overstock sale on 1-story, 8-frame S. W. hives. Shipping cases to hold 24 sections 4¼x4¼x1½ Hoffman frames 1½-inch spacing. Modified frames, Jumbo depth, 1½-inch spacing. Ask for quotations. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—100 2-story 10-frame hives, nailed and painted. About one-half of bodies, covers and bottoms were used one season. Each hive consists of two full depth Langstroth dovetailed bodies, Leahy make, of Idaho white pine, 14½ inches wide inside. One metal roof cover and inner cover. One cypress reversible bottom, 20 nailed and wired, all wood frames with half inch top bar, and 20 full sheets of med. brood foundation, 8¼ in. wide, to fit these frames. Five hives, \$40; 10 hives, \$76; 25 hives, \$180; 100 hives, \$675. 100 same bodies K. D. with rabbets and nails, 5, \$4.25; 10, \$8.25; 100, \$80. 1,000 same frames with nails, per 100, \$4.25; 1,000 sheets same foundation, 70c per lb; 400 Hoffman frames, K. D., 100 at \$5.75. One 50-lb. box and two 25-lb. boxes of Dadant's med. brood foundation for L. frames, 70c per lb. 100 wood and 7 wire queen excluders, never used, 5 for \$3.75, 50 for \$36. 50 cases two 5-gal. cans, each 80c case, f. o. b. Watertown. Send draft, cashier's check or money order. C. E. Dustman, Watertown, Minn.

FOR SALE—100 Root 10-frame, extracting supers, with frames. Lots of 5 K. D. Will discount. D. S. Durrall, Hurdland, Mo.

FOR SALE—Good second-hand double-deck comb-honey shipping cases for 4¼x4¼x1½ sections, 25 cents per case, f. o. b. Cincinnati; terms cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, O.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. WEBER & CO., 2146 Central Ave., Cincinnati, O.

SEND us a list of goods wanted and will quote you lowest prices. We are the money-saving house. Price list free. Try us.
H. S. Duby & Son, St. Anne, Ill.

I MANUFACTURE cypress bee hives, and sell Lewis' beeware. Write for booklet.
J. Tom White, Dublin, Ga.

MISCELLANEOUS

See Atwater's classified honey adv't.

WANTED—Beeswax, old combs and cappings to render on shares. Will pay highest market price and buy your share of the beeswax.
F. J. Rettig & Sons, Wabash, Ind.

WRITE for shipping tags and our prices for rendering your old combs, cappings, etc. We guarantee a first-class job.
The Deroy Taylor Co., Newark, N. Y.

FOR SALE—Silver Spangled Hamburg eggs and fine cockerels.
Elias Fox, Union Center, Wis.

BLACK SIBERIAN HARES—Enormous sizes, delicious meat and beautiful fur. Write for information and prices.
Siberian Fur Farm, Hamilton, Canada.

FOR SALE—Five acres land in Polk County, Florida, suitable for apiary, fruit and vegetables. \$175 for quick sale.
Frank Johnson, Gary, Ind.,
Care Gary Heat, Light & Water Co.

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Order Early and get Prompt
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New labels, new equipment, more help. We are better equipped than ever to supply all kinds of printing for the beekeeper

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Journal
HAMILTON, ILL.

The Golden Tape

A golden tape is reeled before you every day. You cannot stop it, nor retard it, nor hurry it.

And having passed, no power can recall it.

It is absolutely free. You can coin every inch of it and use the coin, or you can let it roll by, untouched by your effort. It travels fast, and no man yet has coined his full quota.

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—H. A. Nelson.

Are You Prepared

Are you prepared, Mr. Beekeeper, to coin the valuable days of flower bloom? They will be here before we realize it. Are you prepared, and ready with sufficient excess supplies, and with the new foundation? Have you enough sections and frames?

We are anxious to serve you in all departments of your work. We are so located as to be able to give you unusually prompt and direct shipments. Let us help you coin the golden tape. We solicit your business and guarantee to satisfy you. Use us.

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OF IOWA

Council Bluffs, Iowa

Read "THE BEEKEEPER"

The only Canadian bee publication. Keeps beekeepers closely in touch with Apicultural conditions in Canada. It is the official organ of the Beekeepers' Associations for the three provinces—Ontario, Manitoba and New Brunswick. Beekeeping and horticulture are effectively combined to make a live, attractive and practical publication.

Price, postpaid, \$1 per year

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Send for a free sample copy

The Horticultural Publishing Co., Ltd., Peterboro, Ontario

FLORIDA BEES AND QUEENS

The first part of April I will be fully ready to fill orders for queens and bees as follows: Two-frame nuclei with untested queen, \$6; untested queens, \$1.50 each; tested, \$2. From my long-tested and best Italian stock.

BEEKEEPERS' SUPPLIES—DADANT'S FOUNDATION

A complete stock of everything for the Dixie beekeepers, right here at home. My cypress catalog of cypress hives and hive parts will interest you in prices.

DIXIE BEEKEEPER

This monthly publication tells of Dixie as a bee country and how we are keeping bees here; \$1 a year. Sample copy free.

J. J. WILDER, Waycross, Georgia

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Conceded to be the Finest Pencil made for general use.

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QUEENS—FINE ITALIAN—QUEENS

FROM SELECTED BRED-UP STOCK

Now booking orders for June delivery at following prices:

Pure mating, safe arrival and satisfaction guaranteed

	1	12	100
Untested	\$1.35	\$15.00	\$110.00
Select Untested	1.75	18.00	150.00
Tested	2.50	24.00	200.00

A few more package bees for late May and early June delivery.

E. A. HARRIS, Albany, Alabama

Am now booking orders for Michigan-bred Queens

THREE BAND ITALIANS ONLY

TESTED DISEASE RESISTORS

PRICES

	June 15 to July 15			July 15 to Oct. 1			
	1	6	12	1	6	12	100
Untested	\$1.50	\$8.00	\$15.00	\$1.30	\$7.50	\$13.50	\$110.00
Select untested	1.75	9.00	16.00	1.60	8.00	14.00	115.00
Select tested, any time after June 20				3.00	16.00	29.00	
Select day-old virgins, after June 160	3.50	6.50	50.00

All queens hatched in nursery cages and any inferior ones are killed.

All queens mated in two-frame or three-frame nuclei. No baby nuclei in yard.

Books opened April 1. If you are going to need good queens this summer now is the time to order them.

D. A. DAVIS, Birmingham, Mich.
216 Greenwood

EARLY QUEENS BY RETURN MAIL

IF YOU WANT THE CHEAPEST, BUY THE BEST

Weather permitting, I will begin mailing my bright Italian Queens April 1, at the following prices:

Untested, single, \$1.50, six for \$7.50, twelve for \$14. Select tested for breeding, \$4 each.

I guarantee every queen I send out, and your money refunded if not satisfied. I also guarantee safe delivery, free from disease; and quick service. All orders will receive prompt attention and will be filled by return mail, or as soon as possible after receiving your order. Now is the time to send in your orders if you want early queens.

A. B. MARCHANT, Jesup, Ga.

THAGARD'S ITALIAN QUEENS

Bred for Quality

Untested \$1.50; 6, \$7.50; 12, \$13.50
Select untested \$1.75; 6, \$9.00; 12, \$16.00

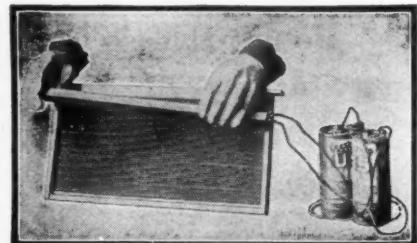
I guarantee pure mating, safe arrival and perfect satisfaction. Circular free.

V. R. THAGARD, Greenville, Ala.

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100 new standard dovetailed, 10-frame hives, never used; nailed, painted two coats white paint; one-story hives complete with Hoffman frames and full sheets foundation, \$3 each. Also 100 extra bodies used one year as supers for extracting, with frames, but no foundation, \$1 each. All painted white, and in fine condition. Cash bargain.

W. B. DAVIS CO., Aurora, Ill.



ELECTRIC IMBEDDER

Price without Batteries \$1.25
Not postpaid.

Actually cements wires in the foundation. Will work with dry cells or with city current in connection with transformer. Best device of its kind on the market.

For sale by all bee supply dealers

Dadant & Sons, Manufacturers
HAMILTON, ILL.

QUEENS FOR SALE

Golden and 3-band Italians (the kind that fill from 2 to 6 supers). Untested (either kind), \$2 each, \$11 for 6; \$45 for 25. No discount for 50 or 100 lots. Tested, \$3 each, \$16 for 6, \$30 for 12. Full colonies of bees (with queen), \$12 and \$15 each for 8 and 10-frame Root Co., hives, without supers.

MISS LULU GOODWIN,
Mankato, Minn., Box 294.

PRICES OF QUEENS

	Nov. 1 to June 1			June 1 to Nov. 1		
	1	6	12	1	6	12
Untested	\$2.00	\$9.00	\$16.80	\$1.50	\$8.00	\$14.50
Select untested	2.25	10.50	18.00	2.00	9.50	16.00
Tested	3.00	16.50	30.00	2.50	12.00	22.00
Select tested	3.50	19.50	36.00	3.00	16.50	30.00

Breeders \$7.50 to \$15.00

Queens for export will be carefully packed in long-distance cages, but safe delivery is not guaranteed.

"The queen that I got from you last season made honey when the other bees were taking lunch to the fields with them (when they went at all)".

H. M. TICHENOR, Centertown, Ky.

2058 Yonge St., Toronto Canada March 19, 1920.

Friend Davis:

The colonies headed by your queens are through this far in fine shape. It was a pleasing sight to see them take their first flight (after 4 months) this last week. What is the price of queens to us folks on this side this year, and when could you start to send me up some? A reply would oblige

Yours Respectfully,

P. F. OLIVER.

No Nuclei, Full Colonies or Pound Packages.

BEN G. DAVIS, Spring Hill, Tenn.

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BEEKEEPERS

We manufacture millions of sections every year that are as good as the best. The **cheapest** for the **quality**; **best** for the price. If you buy them once, you will buy again.

We also manufacture **hives, brood-frames, section holders and shipping cases.**

Our Catalog is free for the asking

MARSHFIELD MFG. CO., Marshfield, Wis.

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Now is the time to order your season's supply of Bee Material so as to have them ready for the honey flow. For lack of hives and other goods, you cannot afford to let your bees fly away, **bees are valuable.** We have everything required for practical beekeeping. Our goods for ideal of quality, quality of workmanship. Our 1920 catalog is now ready to send out, send for one, it is full of good stuff.

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Best goods made. Get our big discount sheet before buying.

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SAVES
HONEY
TIME
MONEY**



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BEES

We furnish full colonies of Italian bees in double-walled hives, single-walled hives, shipping boxes and 3-frame nucleus colonies.

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We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

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Denver, Colo.

Write for Price List and
Booklet descriptive of

**HIGH-GRADE
Italian Queens**

JAY SMITH
Route 3
Vincennes, Ind.



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at Newark, Wayne Co., N. Y., ready to answer your call. The best of everything. Just read this list: Lewis Beeware, Sections, Shipping Cases, Frames, Hives, Hersher Wax Presses and other supplies, Dadant's Unexcelled Foundation, all standard weights and sizes; also the Electric Wire Imbedder, Bingham Uncapping Knives, including steam heated, with oil stoves and generators. Bingham Smokers, all sizes, with genuine leather bellows; Root's Extractors, all sizes of hand and power machines; Bee Books, written by all leading authors in beekeeping.

All sizes of Friction Top Pails, and also 60-lb. Cans, new and second hand. Also Cement-coated Nails for nailing beehives and supplies; and all sized spools of Tinned Wire, Bee Brushes, Feeders, Queen-Rearing Cages, Bee Gloves and Capping Melter, and all practical supplies you will need.

A market for your honey or wax and a plant to render your old combs and cappings.

Over 1,000 beekeepers took advantage of this service station at Newark in 1919 for the first time. Now all together for a greater 1920.

New catalog free. Our discounts will save you money.

THE DERROY TAYLOR CO., Newark
(Wayne Co.) New York.

BEEKEEPERS ATTENTION

You can make your business more profitable and easier to handle through the proper use of modern equipment. This is supplied in LEWIS BEEWARE by

WESTERN HONEY PRODUCERS
SIOUX CITY, IOWA

SEND LIST OF YOUR NEEDS OR REQUEST FOR NEW CATALOG TO DEPT. B

LET US BOOK YOUR ORDERS NOW FOR

ROOT QUEENS

Raised in our famous Home Yard, Basswood Yard, Wardell Yard and Maple Grove Yard, by our experienced queen breeders, Mel Pritchard, Arlie Pritchard and John Mosgrove, under the direct supervision of E. R. Root and our Apiary Manager, M. J. Deyell.

SPECIAL CONTRACT PRICES.—Write immediately for special contract prices, stating quantity wanted, date of delivery desired, and whether tested or untested.

THE A. I. ROOT COMPANY, Medina, O., U. S. A.

QUEENS, SELECT THREE-BANDED ITALIANS

Reared from the best mothers and mated to select drones.

Prices of Queens

	May 1st to June 1st			June 1st to July 1st			July 1st to Nov. 1st		
	1	6	12	1	6	12	1	6	12
Untested.....	\$2.00	\$ 9.00	\$16.80	\$1.50	\$ 8.50	\$14.50	\$1.30	\$ 7.50	\$13.50
Select Untested.....	2.25	10.50	18.00	2.00	9.50	16.00	1.75	8.50	15.00
Tested.....	3.00	16.50	30.00	2.50	12.00	22.00	2.00	10.00	18.50
Select Tested.....	3.50	19.50	36.00	3.00	165.00	30.00	2.75	15.00	27.00

Orders booked now for May delivery. Pure mating, safe arrival and entire satisfaction guaranteed. Wings clipped free. Write for descriptive circular.

HARDIN S. FOSTER, Columbia, Tenn.

Crop and Market Report

Compiled by M. G. Dadant

Owing to the extra long and hard winter, we look for severe losses throughout the whole north of the country, and the reports coming in confirm this to a large extent. Throughout the New England States the losses have been extra heavy, ranging around 25 per cent.

In New York, cellar wintered bees seem to be coming out with a 2 to 4 per cent loss, where there is no disease. Outside, the loss will run from 20 to 30 per cent, and probably more where there is disease. The prevalence of American foulbrood in some localities in New York will just about wipe out some of the beekeepers.

One report from Pennsylvania gives the loss at 40 per cent, while others do not seem to think it will be quite so severe. In New Jersey the loss will be about 25 per cent.

Throughout the southeast the loss does not seem to be so heavy, although we have a report from one of the large Georgia beekeepers that his loss will range around 20 per cent. Other reports indicate from 1 to 5 per cent loss. This applies to all the territory south of the Ohio and east of the Mississippi river.

Losses throughout southern Illinois, Missouri and southern Iowa seem to be small, while further north the losses increase. In Wisconsin cellar wintered bees are coming out in very good shape. In Michigan cellared bees report about a 2 to 5 per cent loss. Through the States of Michigan, Wisconsin and Minnesota, however, outdoor wintered bees are reporting very heavy losses, ranging from 20 to 40 per cent.

In Texas the loss has been from 5 to 15 per cent, averaging probably about 10 per cent, while some apiaries report no loss, with bees in excellent condition. Arizona and New Mexico have an average loss of from 2 to 5 per cent, while Colorado reports better than ordinary with from 2 to 7 per cent loss. Some few apiarists report much heavier loss than this, ranging from 15 to 20 per cent.

In Montana the loss has been fairly large, ranging from 5 to 15 per cent, as it has in Wyoming and Utah. One reporter in Idaho reports 75 per cent of his bees dead on account of honeydew stores.

In California the percentage of loss varies greatly. Some of the best beekeepers report 15 to 20 per cent loss, while some in more favorable localities think that their loss will not run 2 per cent.

CROP PROSPECTS

The white clover prospects are very clouded. In the New England States they seem to be from poor to fair, whereas, New York and Pennsylvania claim very good prospects for clover. Throughout the rest of the north prospects are only fair. Reports from Iowa indicate that

different sections of the State will have from poor to excellent crops of clover, should the weather be good. Throughout the southeast the prospects are very good, as they are in Texas. The northwest cannot report until later just what honey conditions will be, but reports seem to indicate that the sweet clover will come out in good shape. In California the prospects are fair.

WHAT WILL THE PRICE BE?

The poor demand for honey now and the lower price would indicate that the price on honey for next year would not be quite as high as it was last fall. However, the sugar situation has much to do with the price of honey.

We have been following very closely the prices of sugar in the late market and do not see from them any indications that honey should be very low in price. Sugar is selling in the retail market at 28c per pound, and is probably a little higher in the east.

Our wholesale dealer advises us that we will have to pay about 22c to 25c for the next sugar he is able to sell us for feeding our bees, whereas the last lot bought a few weeks ago cost us less than 18c.

Raw sugar is now quoted on the New York market at 18c per pound, with pure refined approximately higher.

The selling of futures in sugar would not give any indications that the price is to drop before winter. Practically every report gives a raise in future of from 60 to 100 points, the only drop in futures being reported for the next March delivery. With such conditions it would not seem that the sugar price would be much below 20c per pound and would possibly range much higher. Inside conversation with a buyer who had bought two or three million pounds of sugar in Cuba last fall indicates that he is of the opinion that sugar will sell at wholesale at from 30 to 35c per pound before winter. With this high price there is no doubt but that honey will hold up to present levels, and probably exceed them.

We give this information for what it is worth and would not care to make any guess as to what the results would be. However, we believe that beekeepers who are holding honey on hand should not be discouraged at not being able to sell it at the figure they are asking. Surely the price of honey cannot drop very much.

The United States Department of Agriculture market report indicates that the demand for honey in all large centers is very weak and few sales are reported. The amount of export during February of honey amounted to 335,000 pounds, whereas last year practically a million pounds were exported.

Take a Tip From Me, Beginners

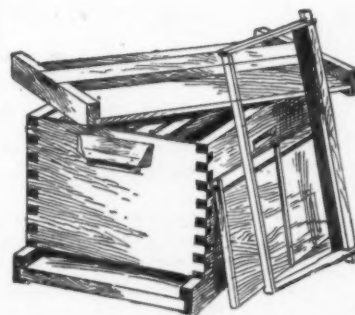


I've used "Falcon" queens and bee supplies over 20 years. Always had luck with them. My advice to you is: let "Falcon" supplies start you on the right road. Swarms of successful apiarists say the same thing.

For over 40 years "Falcon" supplies have been marketed wherever high quality is recognized. Experienced bee-keepers buy them year in and year out.

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Where the Best Beehives Come From



Write for Red Catalog and "Simplified Beekeeping"

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ROOT QUALITY

We are at your service, as you face the coming season, with a full line of all the supplies that you need to make your work successful. Your order can leave our siding over only one of nine trunk lines, and we make it our first consideration to see that it is shipped to you by the cheapest, and over the shortest possible route.

And remember, also, that in accepting any order, we obligate ourselves to serve you in any and every way we can, for bigger and better business.

Use us. We believe that the quality of our goods and the character of our service will please you. Indeed, Mr. Honey-Producer, we guarantee that it will.

ROOT SERVICE

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA



CHARLES MONDENG
 Bee Keepers' Supply Mfg. Plant.

**A BIG STOCK OF
 BEE SUPPLIES**

ALL BOXED, ready to ship at once—thousands of Hoffman Frames; also Jumbo and Shallow Frames

of all kinds—100 and 200 in a box. Big stock of Sections and fine polished Dovetailed Hives and Supers.

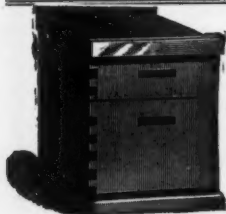
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Will take your Beeswax in Trade at Highest Market Price

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Thirty years' experience in making everything for the beekeeper. A large factory specially equipped for the purpose ensures goods of highest quality. Write for our illustrated catalog today.

LEAHY MFG. CO., 90 Sixth St., Higginsville, Mo.

or J. W. ROUSE, Mexico, Mo.

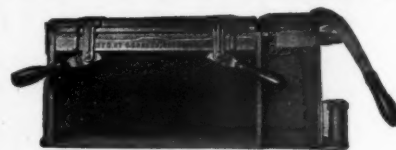
BARNES' Foot Power Machinery

Read what J. E. Rarent, of Chariton, N. Y., says: We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work. This winter we have a double amount of hives, etc., to make with this saw. It will do all you say of it." Catalog and price list free.



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PAT. JULY 30, 1918

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Made for the Hoffman Brood Frames. A combined Nailing, Wiring and Wedge Clamping Device. Has been tried and is guaranteed to do accurate work.

PRICE \$7.50

Complete directions for operating are furnished with each device.

Manufactured by C. O. BRUNO

1413 South West Street, Rockford, Illinois

Established 1885

We are still furnishing beehives made of white pine; they will last. A. I. Root Co.'s make of bee supplies kept in stock. Send for catalog giving full particulars; free for the asking. Beeswax in exchange for supplies, or cash.

JOHN NEBEL & SON SUPPLY CO.
 High Hill, Montg. Co., Mo.

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'SIGN' ON EACH
CYPRESS BOARD



DON'T GUESS
MAKE SURE
'HAVE A LOOK'

For all uses that invite decay (for instance,
bottoms) demand

"ALL-HEART"

"Tidewater" Cypress

"THE WOOD ETERNAL"

The "arrow" on the end of each board identifies the genuine product of the cypress mills whose CHARACTER of timber, methods of manufacture, and complete responsibility enable them to be members of the Association.

THIS FACT IS YOUR PROTECTION.

ACCEPT NONE BUT TRADE-MARKED "TIDEWATER" CYPRESS



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Insist on TRADE-MARKED Cypress at Your Local Lumber Dealer's

If he hasn't it, LET US KNOW

FOREHAND'S THREE BANDS

THE THRIFTY KIND

We have been breeding these queens for the market for over a quarter of a century. They are bred from the imported Italians, but by select breeding we have brightened the color and retained the good qualities of their mothers.

After years of select breeding we have built up a strain of bees that are surpassed by none, but superior to many. Our queens are thrifty, hardy, gentle and beautiful.

We guarantee pure mating, safe arrival and satisfaction.

PRICES: After April to July 1

Untested—1, \$1.50; 6, \$7.50; 12, \$13.50; 100, \$1 each.
Select untested—1, \$1.75; 6, \$9; 12, \$16.50; 100, \$1.25 each.
Tested—1, \$2.50; 6, \$13; 12, \$24.50; 100, \$2 each.
Select tested—1, \$4; 6, \$22; 12, \$41.50; 100, \$3.35 each.

Pound Bees from April 15 to June 30

One-pound package—1, \$3; 25 or more, \$2.75.
Two-pound package—1, \$5; 25 or more, \$4.60.
Three-pound package—1, \$7; 25 or more, \$6.45.
Add the price of the queen wanted.

W. J. FOREHAND & SONS, The Bee Men
Fort Deposit, Alabama

THE BIG HIVE

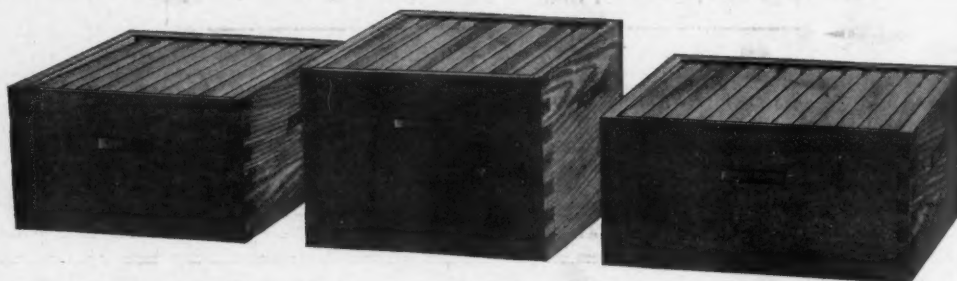
HOW LARGE A HIVE? Beekeepers make very different answers. No one hive can serve the needs of all beekeepers and all beekeeping conditions. So some beekeepers still swear by the Langstroth 8-frame hive, and tell you why it is best for their locality and their honey-flow. They won't have any other. Very many more will say the 10-frame Langstroth is just right. In these later days, there are excellent beekeepers, too, who declare for a bigger hive—they want a deeper hive than the Langstroth, with deeper frames, or they want a hive big enough to hold 12 or 13 of the standard Langstroth frames.

THE JUMBO HIVE

To meet the requirements of beekeepers who have wished the bigger hives, this Company has been manufacturing the "Jumbo" hive for more than 20 years. It is a deep hive, being 11 13-16 inches in depth, and the frames are 11 1/4 inches deep, or 2 1/8 inches deeper than the regular Langstroth. Otherwise it is standard Langstroth. It will take 10 L. supers, covers, bottom-boards, etc., without any change whatever. It has 3,400 square inches of comb capacity as compared with 2,700 in the standard 10-frame hive. It provides completely for the larger brood-chamber, better swarm control, good ventilation, and excellent wintering features, claimed for the deep hive by those who prefer it.

THE SQUARE JUMBO HIVE—13 FRAMES

For those wanting an even larger deep hive than the Jumbo, we supply the Square Jumbo. The depth is the same as the regular Jumbo, but it has 13 frames. The big Jumbo has a comb capacity



The Standard 10-frame Hive

The Jumbo

The Root Square Hive

of 4,400 square inches, with 13 frames (or 63% more than the 10-frame L. hive) and 4,080 with 12 frames and the 1 1/2-inch spacing. It makes a square hive—easy to manipulate because it fits the bottom-board, however it is spaced, and the supers and covers are more easily placed. This hive meets the wants of the advocates of the big, big hive—it is deep and wide both. A shallow-depth super is furnished with this hive.

THE ROOT SQUARE HIVE—13 L. FRAMES

We have now been manufacturing this large hive for a year. It meets the needs of many progressive beekeepers who want a large brood-chamber for building up enormous colonies for the honey-flow, and yet permits the use of the standard L. frames which so many beekeepers have on hand. The single brood-chamber holds 13 frames with 1 3/8-in. spacing, giving a comb capacity of 3,480 sq. ins. (30% more than the standard 10-frame Langstroth); or it will hold 12 Hoffman or metal spaced frames, giving 1 1/2-in. spacing, with one-fifth more comb capacity than the 10-frame hive. Equipment for 1 1/2-in. spacing at the same price as our regular 1 3/8-in. spaced frames. It has the advantages of easy manipulation, due to being square—fits the bottom-board however turned, thus permitting placing combs parallel to the entrance for winters—and supers and covers are easy to place in position. This hive gives a large brood-chamber and either the 1 3/8 or 1 1/2 in. spacing, while it requires only the regular L. frames so generally owned by beekeepers. Shallow extracting supers are regularly furnished with this hive, depth 5 5/8 ins., frames 5 3/8 ins. deep.

Square Jumbo and the Root square (13-fr.) hives furnished at present from Medina only. Write for full description and detailed prices.

THE A. I. ROOT COMPANY, Medina, Ohio